

VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a Major, Municipal permit. The effluent limitations contained in this permit will maintain the Water Quality Standards (WQS) of 9 VAC 25-260. The proposed discharge will result from the operation of a municipal sewage treatment plant (SIC Code: 4952 - Sewerage Systems). This permit action consists of reissuing the permit with revisions to the permit, as needed, due to changes in applicable laws, guidance, and available technical information.

1. Facility Name and Address:
North River WWTF
PO Box 8
Mount Crawford, VA 22841
Location: 856 North River Road, Mount Crawford
2. Permit No. VA0060640; Expiration Date: August 31, 2011
3. Owner: Harrisonburg-Rockingham Regional Sewer Authority
Contact Name: Sharon Foley
Title: Executive Director
Telephone No: 540.434.1053
4. Description of Treatment Works Treating Domestic Sewage:
Total Number of Outfalls – 2

North River WWTF primarily receives sewage wastewater generated by residents and businesses in the City of Harrisonburg, Town of Bridgewater, Town of Dayton, Town of Mount Crawford and surrounding Rockingham County with the balance of the flow generated by commercial and industrial contributors (see permit reissuance application Form 2A, Part F). The WWTF has an approved Industrial Pretreatment Program for regulating the non-domestic contributors' wastewater quality. The treatment units comprising the recently upgraded WWTF are shown in the schematics included in the permit reissuance application.

Average Discharge Flow (July 2009 – June 2011) = 11.5 MGD

Design Average Flow = 22 MGD

5. Application Complete Date: March 10, 2011

Permit Writer: Brandon Kiracofe

Date: June 15, 2011

Reviewed By: Dawn Jeffries

Date: June 16, 2011

Public Comment Period: July 20, 2011 to August 19, 2011

6. Receiving Stream Name: North River
River Mile: Outfall 001: 15.01
Use Impairment: Yes
Special Standards: pH
Tidal Waters: No
Watershed Name: VAV – B23R Lower North River
Basin: Potomac; Subbasin: Shenandoah
Section: 5; Class: IV
7. Operator License Requirements per 9 VAC 25-31-200.C: Class I

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8. Reliability Class per 9 VAC 25-790: Class I (assigned w/ December 8, 2010, Certificate to Operate (CTO))
9. Permit Characterization:
☐ Private ☐ Federal ☐ State ☒ POTW ☐ PVOTW
☐ Possible Interstate Effect ☐ Interim Limits in Other Document (attach copy of CSO)

10. Discharge Location Description and Receiving Waters Information: Appendix A

11. Antidegradation (AD) Review & Comments per 9 VAC 25-260-30:
Tier Designation: North River: Tier 1

The State Water Control Board's WQS include an AD policy. All state surface waters are provided one of three levels of AD protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 waters have water quality that is better than the WQS. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 waters are exceptional waters and are so designated by regulatory amendment. The AD policy prohibits new or expanded discharges into exceptional waters.

The AD review begins with a Tier determination. North River downstream of the facility discharge location is determined to be Tier 1 because the stream does not meet the General Standard (Benthics) for aquatic life use. AD baselines are not calculated for Tier 1 waters.

12. Site Inspection: Performed by Bill Maddox on August 12, 2010

13. Effluent Screening and Effluent Limitations: Appendix B

14. Whole Effluent Toxicity (WET) Program Requirements per 9 VAC 25-31-220.D: Appendix B

15. Sewage sludge utilization and disposal options include the following:
- land application of biosolids by Houff's Feed & Fertilizer Company under their VPA Permits
 - land application of biosolids by Recyc Systems, Inc. under their VPA Permits
 - transport of sewage sludge to the Rockingham County Landfill

16. Bases for Special Conditions: Appendix C

17. Material Storage per 9 VAC 25-31-280.B.2: This permit requires that the facility's O&M Manual include information to address the management of wastes, fluids, and pollutants which may be present at the facility, to avoid unauthorized discharge of such materials.

18. Antidegradation Review per 9 VAC 25-31-220.L: This permit complies with Antidegradation provisions of the VPDES Permit Regulation.

19. Impaired Use Status Evaluation per 9 VAC 25-31-220.D: North River in the vicinity of the discharge is listed as not meeting the General Standard (Benthics) for aquatic life use. This section of river is also listed as having elevated levels of coliform bacteria. A TMDL addressing the bacteria impairment includes the following WLA for this discharge:

E. coli: 4.876×10^{15} cfu/yr (based on a design flow of 28 MGD and a concentration of 126 cfu/100 mL)

A TMDL addressing the benthic impairment has not been prepared. The permit contains a re-opener condition that may allow the permit limits to be modified, in compliance with section 303(d)(4) of the Act once a TMDL is approved.

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20. Regulation of Users per 9 VAC 25-31-280.B.9: N/A – This facility is owned by a municipality.
21. Storm Water Management per 9 VAC 25-31-120: Application Required? ☒ Yes ☐ No
This facility has obtained coverage under the VPDES General Permit for Storm Water Discharges Associated with Industrial Activity (Permit No. VAR052036).
22. Compliance Schedule per 9 VAC 25-31-250: There are no compliance schedules included in the reissued permit.
23. Variances/Alternative Limits or Conditions per 9 VAC 25-31-280.B, 100.J, 100.P, and 100.M: The applicant requested a waiver for sampling fecal coliform at Outfall 001 and all parameters at Outfall 002 (Bypass of Cascade Aeration). Approval of this waiver request was received from EPA.
24. Financial Assurance Applicability per 9 VAC 25: N/A – This facility is owned by a municipality.
25. Virginia Environmental Excellence Program (VEEP) Evaluation per § 10.1-1187.1-7: At the time of this reissuance, is this facility considered by DEQ to be a participant in the Virginia Environmental Excellence Program in good standing at either the Exemplary Environmental Enterprise (E3) level or the Extraordinary Environmental Enterprise (E4) level? ☐ Yes ☒ No
26. Nutrient Trading Regulation per 9 VAC 25-820: See Appendix B
General Permit Required: ☒ Yes ☐ No
27. Threatened and Endangered (T&E) Species Screening per 9 VAC 25-260-20 B.8: Because the permit includes an expansion flow tier for which T&E screening has not been previously performed, T&E screening was performed in accordance with Guidance Memo No. 07-2007. The USFWS screening indicated that the Madison Cave isopod, which is a federally listed threatened species, is present in Rockingham County; however, the DGIF screening did not indicate the presence of state or federally listed threatened or endangered species or designated Threatened or Endangered Species Waters within the mixing zone or within 2 miles of the discharge location and that are hydrologically connected to the receiving waters. The DCR screening indicated natural heritage resources in the project area. The project was sent to DCR for review. DCR provided the following comments which were forwarded to the permittee for their consideration.

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

This project either overlies or is adjacent to a karst landscape characterized by sinkholes, caves, disappearing streams, and large springs. If such features are encountered during the project, please coordinate with Wil Orndorff (540-394-2552, Wil.Orndorff@dcr.virginia.gov) to document and minimize adverse impacts. Discharge of runoff to sinkholes or sinking streams, filling of sinkholes, and alteration of cave entrances can lead to surface collapse, flooding, erosion and sedimentation, groundwater contamination, and degradation of subterranean habitat for natural heritage resources. If the project involves filling or "improvement" of sinkholes or cave openings, DCR would like detailed location information and copies of the design specifications. In cases where sinkhole improvement is for stormwater discharge, copies of VDOT Form EQ-120 will suffice.

Our files do not indicate the presence of any State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

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Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects. New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from <http://vafwis.org/fwis/> or contact Shirl Dressler at (804) 367-6913.

28. Public Notice Information per 9 VAC 25-31-280.B: All pertinent information is on file, and may be inspected and copied by contacting Brandon Kiracofe at: DEQ-Valley Regional Office, P.O. Box 3000, Harrisonburg, Virginia 22801, Telephone No. (540) 574-7892, brandon.kiracofe@deq.virginia.gov.

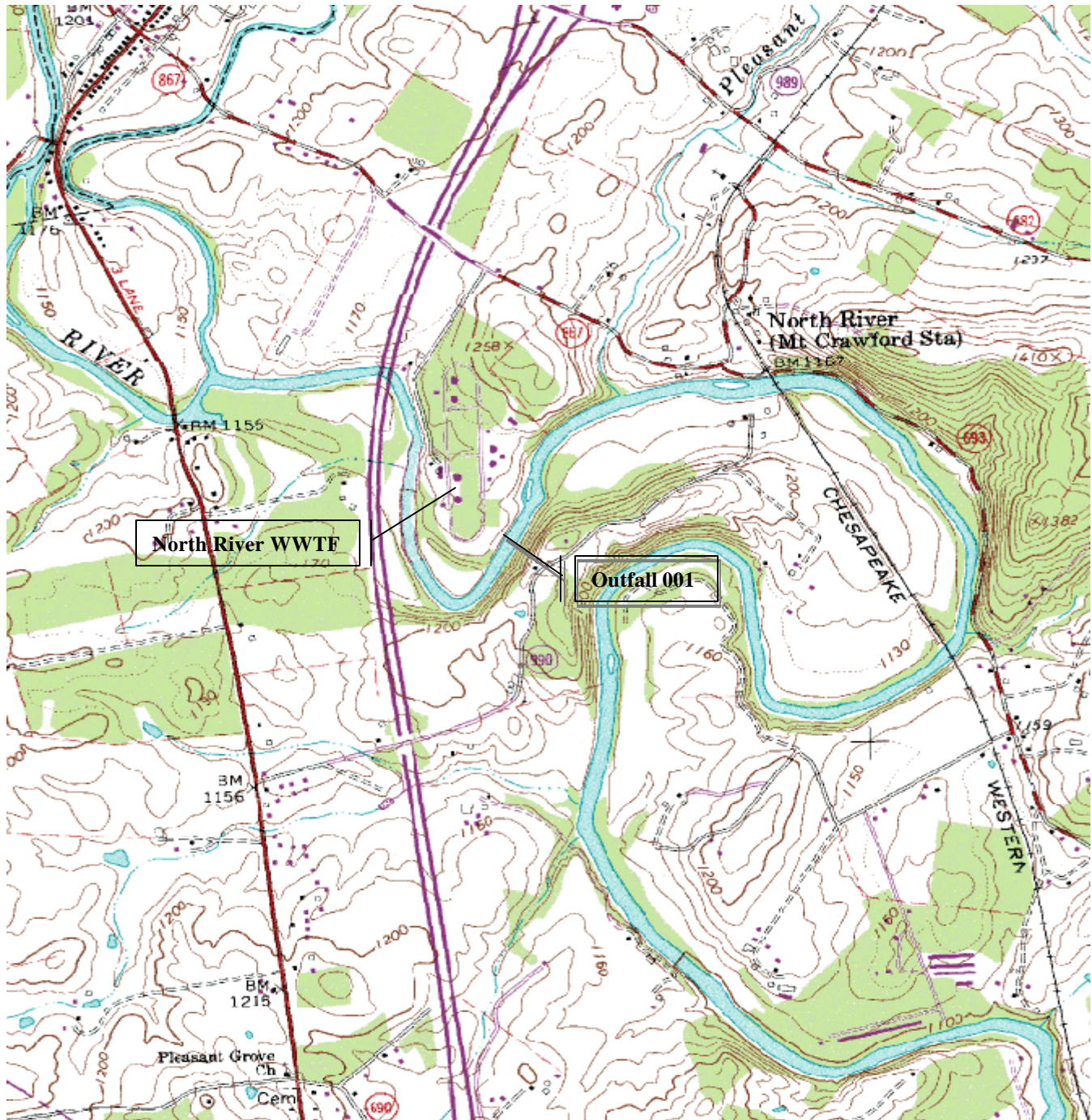
Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing if public response is significant. Requests for public hearings shall state the reason why a hearing is requested, the nature of the issues proposed to be raised in the public hearing and a brief explanation of how the requester's interests would be directly and adversely affected by the proposed permit action. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given.

29. Historical Record: The original permit was issued May 1, 1976. The design flow was 8.0 MGD, and the permit limited BOD₅, DO, Fecal Coliform, Chlorine, and TSS. The permit was reissued on April 1, 1981; April 1, 1986; April 1, 1991 with a design flow of 8.0 MGD. With the 1991 reissuance, Ammonia-N limits were added. The permits issued on April 1, 1996 and April 9, 2001 included a design flow of 16.0 MGD, and they included limits for the same parameters as the previous permits. With the 2006 reissuance, design flow tiers of 22 MGD and 28 MGD were included. The CTO for the 22 MGD facility was issued on December 8, 2010.

APPENDIX A

DISCHARGE LOCATION AND RECEIVING WATERS INFORMATION

North River WWTF discharges to North River in Rockingham County. The topographic map below shows the location of the treatment facility and Outfall 001. Outfall 002 is recognized in the permit as a cascade aeration bypass. Outfall 002 is located directly next to Outfall 001. Outfall 002 is not authorized to discharge except as provided in Part II.U. of the permit and in accordance with the State Water Control Board's VPDES Permit Regulation. Upon initiating a discharge from Outfall 002 and for the duration of the bypass, all monitoring requirements that apply to Outfall 001 in Part I.A. of the permit shall also apply to Outfall 002.



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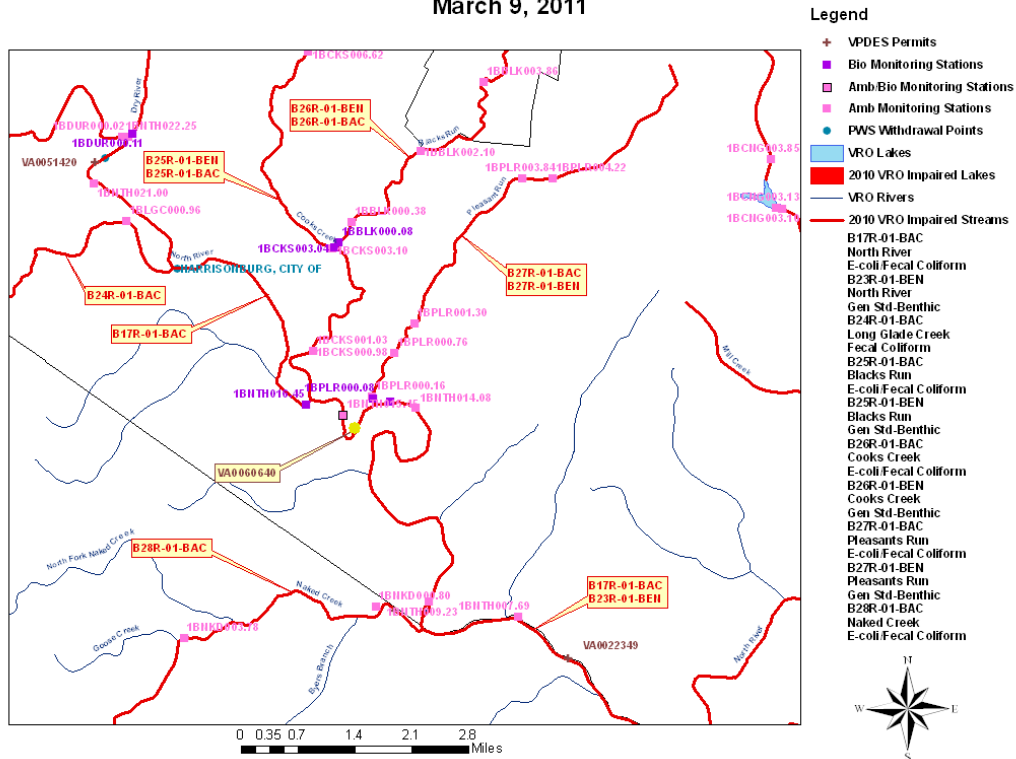
PLANNING INFORMATION

Relevant points of interest within the watershed and in the vicinity of the discharge are shown on the Water Quality Assessment TMDL Review table and corresponding map below.

WATER QUALITY ASSESSMENTS REVIEW						
POTOMAC-SHENANDOAH RIVER BASIN						
3/9/2011						
IMPAIRED SEGMENTS						
SEGMENT ID	STREAM	SEGMENT START	SEGMENT END	SEGMENT LENGTH	PARAMETER	
B17R-01-BAC	North River	24.96	0.00	24.96	E-coli, Fecal Coliform	
B23R-01-BEN	North River	16.32	0.00	16.32	Benthic	
B24R-01-BAC	Long Glade Creek	10.71	0.00	10.71	Fecal Coliform	
B25R-01-BAC	Cooks Creek	13.31	0.00	13.31	E-coli, Fecal Coliform	
B25R-01-BEN	Cooks Creek	13.31	0.00	13.31	Benthic	
B26R-01-BAC	Blacks Run	10.73	0.00	10.73	E-coli, Fecal Coliform	
B26R-01-BEN	Blacks Run	10.73	0.00	10.73	Benthic	
B27R-01-BAC	Pleasant Run	6.3	0.00	6.3	E-coli, Fecal Coliform	
B27R-01-BEN	Pleasant Run	6.3	0.00	6.3	Benthic	
B28R-01-BAC	Naked Creek	6.85	0.00	6.85	E-coli, Fecal Coliform	
PERMITS						
PERMIT	FACILITY	STREAM	RIVER MILE	LAT	LONG	WBID
VA0060640	North River WWTF	North River	15.01	382025	785547	VAV-B23R
VA0022349	Weyers Cave STP	North River	6.91	381756	785254	VAV-B23R
VA0051420	Bridgewater WTP	North River	21.40	382317	785918	VAV-B23R
VA0088188	Weyers Cave WTP	Naked Creek X-Trib	0.038	381827	0785516	VAV-B28R
MONITORING STATIONS						
STREAM	NAME	RIVER MILE	RECORD	LAT	LONG	
Cooks Creek	1BCKS003.04	3.04	1984.00	382221	0785603	
Dry River	1BDUR000.11	0.11	34881.00	382334	0785846	
North River	1BNTH014.48	14.48	1984.00	382042	0785518	
North River	1BNTH016.45	16.45	34243.00	382040	0785627	
Pleasant Run	1BPLR000.08	0.08	1984.00	382044	0785532	
Blacks Run	1BBLK000.08	0.08		382224	0785559	
North River	1BNTH015.45	15.45	38286.00	382033	0785557	
North River	1BNTH009.23	9.23	3/13/06	381833	0785448	
Blacks Run	1BBLK002.10	2.1	3/3/70	382223	0785452	
Cooks Creek	1BCKS003.10	3.1	07/01/91	382221	0785604	
Dry River	1BDUR000.02	0.02	07/01/93	382333	0785851	
Long Glade Creek	1BLGC000.96	0.96	07/01/94	382239	0785853	
Blacks Run	1BBLK000.38	0.38	07/01/91	382238	0785549	
Naked Creek	1BNKD000.80	0.8	07/01/91	381830	0785531	
North River	1BNTH014.08	14.08	01/08/78	382038	0785457	
North River	1BNTH021.00	21	08/04/88	382303	0785919	
Pleasant Run	1BPLR000.16	0.16	09/08/93	382045	0785533	
Cooks Creek	1BCKS000.98	0.98	1/2/01	382115	0785621	
Cooks Creek	1BCKS001.03	1.03	9/23/99	382115	0785621	
North River	1BNTH007.69	7.69	5/11/01	381823	0785335	
North River	1BNTH022.25	22.25	9/23/99	382333	0785856	
Pleasant Run	1BPLR000.76	0.76	6/28/00	382113	0785514	
Pleasant Run	1BPLR001.30	1.3	6/28/00	382132	0785458	
Pleasant Run	1BPLR003.84	3.84	6/28/00	38235	0785329	
Pleasant Run	1BPLR004.22	4.22	6/28/00	38235	078534	
Naked Creek	1BNKD003.78	3.78	7/8/03	381810	0785808	
PUBLIC WATER SUPPLY INTAKES						
OWNER	STREAM	RIVER MILE				
None						
WATER QUALITY MANAGEMENT PLANNING REGULATION						
Is this discharge addressed in the WQMP regulation? Yes						
If Yes, what effluent limitations or restrictions does the WQMP regulation impose on this discharge?						
PARAMETER	ALLOCATION					
CBOD	700 kg/d JAN-MAY - 800 kg/d JUN-DEC					
TKN	420 kg/d JUN-DEC - 850 kg/d JAN-MAY					
Nutrients under the Watershed General Permit						
WATERSHED NAME						
VAV-B23R Lower North River						

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North River WWTP - Water Quality Assessments Review March 9, 2011



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FLOW FREQUENCY DETERMINATION

MEMORANDUM
DEPARTMENT OF ENVIRONMENTAL QUALITY
VALLEY REGIONAL OFFICE

4411 Early Road – P.O. Box 3000

Harrisonburg, VA 22801

SUBJECT: Flow Frequency Determination
North River WWTF – VPDES Permit No. VA0060640, Rockingham County

TO: Kate Harrigan

FROM: Jason Dameron

DATE: July 11, 2011

This memo supersedes Brandon Kiracofe's flow frequency determination dated September 20, 2005. The subject facility discharges to North River near Mt. Crawford, VA. Stream flow frequencies are required at this site for use by the permit writer in developing effluent limitations for the VPDES permit reissuance.

The USGS and VDEQ have operated a continuous record gage on North River near Burkettown, VA (#01622000) since 1926. This gage is located approximately 1 mile downstream of the discharge point. The values at the discharge point were determined by drainage area proportions and do not address any discharges, withdrawals, or springs located between the gage and the discharge point. Because water sources for the users discharging to North River WWTF are within the watershed above the North River WWTF discharge point, the North River WWTF average discharge flow over the past 24 months was subtracted from all of the flow frequencies listed below for the discharge point. The flow frequencies are presented below.

North River near Burkettown, VA (#01622000)

Drainage Area = 376 mi²

1Q30 = 29 cfs	High Flow 1Q10 = 59 cfs
1Q10 = 34 cfs	High Flow 7Q10 = 67 cfs
7Q10 = 39 cfs	High Flow 30Q10 = 83 cfs
30Q10 = 44 cfs	HM = 144 cfs
30Q5 = 50 cfs	

North River at discharge point:

Drainage Area = 370.11 mi²

1Q30 = 28.5 cfs	(18.4 MGD)	High Flow 1Q10 = 58.1 cfs	(37.6 MGD)
1Q10 = 33.5 cfs	(21.7 MGD)	High Flow 7Q10 = 65.9 cfs	(42.6 MGD)
7Q10 = 38.4 cfs	(24.8 MGD)	High Flow 30Q10 = 81.7 cfs	(52.8 MGD)
30Q10 = 43.3 cfs	(28.0 MGD)	HM = 142 cfs	(91.8 MGD)
30Q5 = 49.2 cfs	(31.8 MGD)		

North River at discharge point – North River STP average discharge flow:

1Q30 = 18.4 MGD – 11.5 MGD =	6.90 MGD
1Q10 = 21.7 MGD – 11.5 MGD =	10.2 MGD
7Q10 = 24.8 MGD – 11.5 MGD =	13.3 MGD
30Q10 = 28.0 MGD – 11.5 MGD =	16.5 MGD
30Q5 = 31.8 MGD – 11.5 MGD =	20.3 MGD
High Flow 1Q10 = 37.6 MGD – 11.5 MGD =	26.1 MGD
High Flow 7Q10 = 42.6 MGD – 11.5 MGD =	31.1 MGD
High Flow 30Q10 = 52.8 MGD – 11.5 MGD =	41.3 MGD
HM = 91.8 MGD – 11.5 MGD =	80.3 MGD

The high flow months are January through May.

Reviewer: BDK

Date: 07-11-11

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EFFLUENT/STREAM MIXING EVALUATION

Mixing zone predictions were made with the Virginia DEQ Mixing Zone Analysis Version 2.1 program. The predictions are based on the discharge and receiving stream characteristics, and are presented below.

22 MGD Annual Mix	28 MGD Annual Mix
<p>Effluent Flow = 22 MGD Stream 7Q10 = 13.3 MGD Stream 30Q10 = 16.5 MGD Stream 1Q10 = 10.2 MGD Stream slope = 0.0011 ft/ft Stream width = 60 ft Bottom scale = 3 Channel scale = 1</p> <hr/> <p>Mixing Zone Predictions @ 7Q10 Depth = 1.5593 ft Length = 2295.1 ft Velocity = .584 ft/sec Residence Time = .0455 days Recommendation: A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.</p> <hr/> <p>Mixing Zone Predictions @ 30Q10 Depth = 1.6445 ft Length = 2191.59 ft Velocity = .604 ft/sec Residence Time = .042 days Recommendation: A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.</p> <hr/> <p>Mixing Zone Predictions @ 1Q10 Depth = 1.474 ft Length = 2409.47 ft Velocity = .5636 ft/sec Residence Time = 1.1876 hours Recommendation: A complete mix assumption is appropriate for this situation providing no more than 84.2% of the 1Q10 is used.</p>	<p>Effluent Flow = 28 MGD Stream 7Q10 = 13.3 MGD Stream 30Q10 = 16.5 MGD Stream 1Q10 = 10.2 MGD Stream slope = 0.0011 ft/ft Stream width = 60 ft Bottom scale = 3 Channel scale = 1</p> <hr/> <p>Mixing Zone Predictions @ 7Q10 Depth = 1.7166 ft Length = 2111.44 ft Velocity = .6207 ft/sec Residence Time = .0394 days Recommendation: A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.</p> <hr/> <p>Mixing Zone Predictions @ 30Q10 Depth = 1.7972 ft Length = 2028.76 ft Velocity = .6388 ft/sec Residence Time = .0368 days Recommendation: A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.</p> <hr/> <p>Mixing Zone Predictions @ 1Q10 Depth = 1.6366 ft Length = 2200.73 ft Velocity = .6022 ft/sec Residence Time = 1.0151 hours Recommendation: A complete mix assumption is appropriate for this situation providing no more than 98.51% of the 1Q10 is used.</p>
22 MGD Wet Season Mix	28 MGD Wet Season Mix
<p>Effluent Flow = 22 MGD Stream 7Q10 = 31.1 MGD Stream 30Q10 = 41.3 MGD Stream 1Q10 = 26.1 MGD Stream slope = 0.0011 ft/ft Stream width = 75 ft Bottom scale = 3 Channel scale = 1</p> <hr/> <p>Mixing Zone Predictions @ 7Q10 Depth = 1.7388 ft Length = 3286.4 ft Velocity = .6303 ft/sec Residence Time = .0603 days Recommendation: A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.</p> <hr/> <p>Mixing Zone Predictions @ 30Q10 Depth = 1.936 ft Length = 2994.87 ft Velocity = .6748 ft/sec Residence Time = .0514 days Recommendation: A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.</p> <hr/> <p>Mixing Zone Predictions @ 1Q10 Depth = 1.6369 ft Length = 3461.98 ft Velocity = .6065 ft/sec Residence Time = 1.5857 hours Recommendation: A complete mix assumption is appropriate for this situation providing no more than 63.07% of the 1Q10 is used.</p>	<p>Effluent Flow = 28 MGD Stream 7Q10 = 31.1 MGD Stream 30Q10 = 41.3 MGD Stream 1Q10 = 26.1 MGD Stream slope = 0.0011 ft/ft Stream width = 75 ft Bottom scale = 3 Channel scale = 1</p> <hr/> <p>Mixing Zone Predictions @ 7Q10 Depth = 1.8564 ft Length = 3105.8 ft Velocity = .6571 ft/sec Residence Time = .0547 days Recommendation: A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.</p> <hr/> <p>Mixing Zone Predictions @ 30Q10 Depth = 2.0464 ft Length = 2854.3 ft Velocity = .6989 ft/sec Residence Time = .0473 days Recommendation: A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.</p> <hr/> <p>Mixing Zone Predictions @ 1Q10 Depth = 1.7588 ft Length = 3254.14 ft Velocity = .6349 ft/sec Residence Time = 1.4238 hours Recommendation: A complete mix assumption is appropriate for this situation providing no more than 70.24% of the 1Q10 is used.</p>

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APPENDIX B

EFFLUENT SCREENING AND EFFLUENT LIMITATIONS

EFFLUENT LIMITATIONS

A comparison of technology and water quality-based limits was performed and the most stringent limits were selected, as summarized in the table below.

Outfall 001

Final Limits

Design Flow: 22 MGD

PARAMETER	BASIS FOR LIMITS	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Avg.		Maximum		Frequency	Sample Type
Flow (MGD)	1	NL		NL		Continuous	TIRE
-----	-----	Monthly Avg.		Weekly Avg.		-----	-----
CBOD ₅ (Jun-Dec)	3,4,5	10 mg/L	800 kg/d	15 mg/L	1200 kg/d	1/Day	24 HC
CBOD ₅ (Jan-May)	3,4,5	8 mg/L	700 kg/d	12 mg/L	1000 kg/d	1/Day	24 HC
TKN (as N)(Jun-Dec)	3,4,5	5.0 mg/L	420 kg/d	7.5 mg/L	620 kg/d	1/Week	24 HC
TKN (as N)(Jan-May)	3,4,5	9.3 mg/L	770 kg/d	14 mg/L	1200 kg/d	1/Week	24 HC
TSS	2	30 mg/L	2500 kg/d	45 mg/L	3700 kg/d	1/Month	24 HC
Ammonia-N (Jun-Dec)(mg/L)	3	3.3		4.1		1/Day	24 HC
Ammonia-N (Jan-May)(mg/L)	3	6.4		7.9		1/Day	24 HC
Effluent Chlorine (TRC)(mg/L)*	3	0.011		0.012		1/2 Hours	Grab
E. coli (N/100 mL) (geometric mean)	3	126		NA		4/Month* or 1/Day** between 10 am to 4 pm	Grab
-----	-----	Annual Average		Maximum		-----	-----
TP – Year to Date (mg/L)	8	NL		NA		1/Month	Calculated
TP – Calendar Year (mg/L)	8,9	0.28		NA		1/Year	Calculated
TN – Year to Date (mg/L)	8	NL		NA		1/Month	Calculated
TN – Calendar Year (mg/L)	8,9	3.8		NA		1/Year	Calculated
-----	-----	Minimum		Maximum		-----	-----
pH (S.U.)	3	6.5		9.5		1/Day	Grab
Dissolved Oxygen (mg/L)	3,4	6.5		NA		1/Day	Grab
Contact Chlorine (TRC)(mg/L)*	3,7	1.0		NA		1/2 Hours	Grab

NL = No Limitation, monitoring required

NA = Not Applicable

TIRE = Totalizing, Indicating, and Recording equipment

24 HC = 24-Hour Composite

4/Month = 4 samples taken weekly during the calendar month

* = Applicable only when chlorination is used for disinfection

** = Applicable if an alternative to chlorination is used for disinfection.

BASIS DESCRIPTIONS

1. VPDES Permit Regulation (9 VAC 25-31)
2. Federal Effluent Requirements (Secondary Treatment Regulation - 40CFR133)
3. Water Quality Standards (9 VAC 25-260)
4. North River QUAL2K Stream Model
5. WQMP Regulation (9 VAC 25-720-50)
6. North River TMDL Report
7. Best Professional Judgment (BPJ)
8. GM No. 07-2008, Amendment No. 2, 10/23/07, Permitting Considerations for Facilities in the Chesapeake Bay Watershed
9. Annual average concentration limits are based on the Technology Regulation (9 VAC 25-40)

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Outfall 001

Final Limits

Design Flow: 28 MGD

PARAMETER	BASIS FOR LIMITS	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Avg.		Maximum		Frequency	Sample Type
Flow (MGD)	1	NL		NL		Continuous	TIRE
-----	-----	Monthly Avg.		Weekly Avg.		-----	-----
cBOD ₅ (Jun-Dec)	3,4,5	8 mg/L	800 kg/d	12 mg/L	1300 kg/d	1/Day	24 HC
cBOD ₅ (Jan-May)	3,4,5	7 mg/L	700 kg/d	10 mg/L	1060 kg/d	1/Day	24 HC
TKN (as N)(Jun-Dec)	3,4,5	4.0 mg/L	420 kg/d	6.0 mg/L	640 kg/d	1/Week	24 HC
TKN (as N)(Jan-May)	3,4,5	8.0 mg/L	850 kg/d	12 mg/L	1300 kg/d	1/Week	24 HC
TSS	2	30 mg/L	3200 kg/d	45 mg/L	4800 kg/d	1/Month	24 HC
Ammonia-N (Jun-Dec)(mg/L)	3	3.1		3.8		1/Day	24 HC
Ammonia-N (Jan-May)(mg/L)	3	5.8		7.1		1/Day	24 HC
Effluent Chlorine (TRC)(mg/L)*	3	0.010		0.011		1/2 Hours	Grab
E. coli (N/100 mL) (geometric mean)	3,6	126		NA		4/Month* or 1/Day** between 10 am to 4 pm	Grab
-----	-----	Annual Average		Maximum		-----	-----
TP – Year to Date (mg/L)	8	NL		NA		1/Month	Calculated
TP – Calendar Year (mg/L)	8,9	0.22		NA		1/Year	Calculated
TN – Year to Date (mg/L)	8	NL		NA		1/Month	Calculated
TN – Calendar Year (mg/L)	8,9	3.0		NA		1/Year	Calculated
-----	-----	Minimum		Maximum		-----	-----
pH (S.U.)	3	6.5		9.5		1/Day	Grab
Dissolved Oxygen (mg/L)	3,4	6.5		NA		1/Day	Grab
Contact Chlorine (TRC)(mg/L)*	3,7	1.0		NA		1/2 Hours	Grab

NL = No Limitation, monitoring required

NA = Not Applicable

TIRE = Totalizing, Indicating, and Recording equipment

24 HC = 24-Hour Composite

4/Month = 4 samples taken weekly during the calendar month

* = Applicable only when chlorination is used for disinfection

** = Applicable if an alternative to chlorination is used for disinfection.

BASIS DESCRIPTIONS

1. VPDES Permit Regulation (9 VAC 25-31)
2. Federal Effluent Requirements (Secondary Treatment Regulation - 40CFR133)
3. Water Quality Standards (9 VAC 25-260)
4. North River QUAL2K Stream Model
5. WQMP Regulation (9 VAC 25-720-50)
6. North River TMDL Report
7. Best Professional Judgment (BPJ)
8. GM No. 07-2008, Amendment No. 2, 10/23/07, Permitting Considerations for Facilities in the Chesapeake Bay Watershed
9. Annual average concentration limits are based on the Technology Regulation (9 VAC 25-40)

Fact Sheet – VPDES Permit No. VA0060640 – North River WWTF

LIMITING FACTORS – OVERVIEW:

The following potential limiting factors have been considered in developing this permit and fact sheet:

Water Quality Management Plan Regulation (WQMP) (9 VAC 25-720)	
A. TMDL limits	E. coli
B. Non-TMDL WLAs	cBOD₅, TKN
C. CBP (TN & TP) WLAs	TN and TP via GP VAN010042
Federal Effluent Guidelines	cBOD₅, TSS, pH
BPJ/Agency Guidance limits	TRC (contact)
Water Quality-based Limits - numeric	cBOD₅, DO, TRC (effluent), E. coli, pH, Ammonia-N
Water Quality-based Limits - narrative	None
Technology-based Limits (9 VAC 25-40-70)	TN, TP
Whole Effluent Toxicity (WET)	See Appendix D
Storm Water Limits	GP VAR052036

EVALUATION OF THE EFFLUENT – CONVENTIONAL POLLUTANTS:

The discharge from this facility was previously modeled by Dewberry using the QUAL2E model. The discharge was remodeled at this reissuance by Dewberry using the QUAL2K model to include updated stream and effluent information. The following limits were demonstrated to be protective:

	22 MGD (Jun-Dec)	22 MGD (Jan-May)	28 MGD (Jun-Dec)	28 MGD (Jan-May)
CBOD ₅ (mg/L)	10	8	8	7
TKN (mg/L)	5.0	9.3	4.0	8.0
DO (mg/L)	6.5	6.5	6.5	6.5

The QUAL2K model for North River is maintained in the DEQ receiving stream DO model file.

Monthly average CBOD₅ and TKN loading limits for the two flow tiers were calculated to be:

	22 MGD (Jun-Dec)	22 MGD (Jan-May)	28 MGD (Jun-Dec)	28 MGD (Jan-May)
CBOD ₅ (kg/d)	800	700	800	700
TKN (kg/d)	420	770	420	850

The Potomac-Shenandoah River Basin WQMP specifies the following monthly average CBOD₅ and TKN limits for North River WWTF:

	WQMP Loading Limits (kg/d)	
	(Jun-Dec)	(Jan-May)
CBOD ₅ (kg/d)	800	700
TKN (kg/d)	420	850

As indicated by the tables above, the loading limits that have been imposed in the permit do not exceed the WQMP loading limits.

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More stringent CBOD₅ (Jan-May) limits have been determined to be necessary for the 22 MGD flow tier. The monthly average CBOD₅ (Jun-Dec) loading limit for the 22 MGD flow tier has been reduced from 830 kg/d to 800 kg/d in order to not exceed the WQMP loading limit. A review of compliance data suggests that the facility is currently meeting the more stringent limit; therefore, a schedule of compliance for meeting the more stringent limit has not been provided. A less stringent maximum weekly average CBOD₅ (Jan-May) loading limit for the 28 MGD flow tier has been included. Because the limits for the 28 MGD flow tier have not become effective, the less stringent limit complies with antibacksliding requirements. All other CBOD₅ limits for the 28 MGD flow tier are identical to those included in the previous permit. The monitoring frequency of 1/Day for CBOD₅ (Jun-Dec) and CBOD₅ (Jan-May) has been carried forward from the previous permit for both flow tiers.

The previous permit included only loading limits for TKN for the 22 MGD and 28 MGD flow tiers. In order to ensure compliance with the modeled effluent TKN concentration values, TKN concentration limits have been included at this reissuance. Less stringent TKN (Jun-Dec) and TKN (Jan-May) loading limits have been determined to be necessary for the 22 MGD flow tier. Because new stream temperature information was available, the less stringent limits comply with antibacksliding requirements. The TKN loading limits for the 28 MGD flow tier are identical to those included in the previous permit. The monitoring frequency of 1/Week for TKN (Jun-Dec) and TKN (Jan-May) has been carried forward from the previous permit for both flow tiers based on the fact that daily monitoring is required for Ammonia-N, the Ammonia-N limits are approximately half of the TKN limits, the facility has been upgraded to include enhanced nutrient removal technology, and the facility is required to meet an annual average TN concentration limit of 3.8 mg/L at the 22 MGD flow tier and 3.0 mg/L at the 28 MGD flow tier.

The DO limits have been carried forward from the previous permit for both flow tiers.

The TSS limits are consistent with the Secondary Treatment Regulation and have been carried forward from the previous permit for both flow tiers.

The pH limits reflect the current WQS for pH in the receiving stream and have been carried forward from the previous permit for both flow tiers.

EVALUATION OF THE EFFLUENT – DISINFECTION:

The TRC disinfection requirements have been carried forward from the previous permit. In addition to the minimum TRC contact requirements, E. coli monitoring at a frequency of 4/Month and an associated limit have been included at this reissuance to ensure effective disinfection is achieved. If an alternative to chlorination is utilized, E. coli monitoring at a frequency of 1/Day and an associated limit have been included at this reissuance. The E. coli limits are consistent with the TMDL WLA of 4.876×10^{13} cfu/yr and are protective of the current WQS for E. coli in the receiving stream.

EVALUATION OF THE EFFLUENT – NUTRIENTS:

In accordance with § 62.1-44.19:14.C.5. of the Code of Virginia, this Significant Discharger has submitted a Registration Statement and DEQ has recognized that they are covered under the General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for TN and Total Phosphorus (TP) Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia (9 VAC 25-820) (GP). The effective date of coverage is January 1, 2007. Coverage under the GP will expire December 31, 2011. The load limit for TN is 253,391 pounds per calendar year and TP is 19,004 pounds per calendar year.

The Regulation for Nutrient Enriched Waters and Dischargers within the Chesapeake Bay Watershed (9 VAC 25-40-70) stipulates the inclusion of technology-based effluent concentration limits in the individual permit for any facility that has installed technology for the control of nitrogen and phosphorous whether by new construction, expansion, or upgrade. Technology based annual average effluent concentration limits of TN = 3.8 mg/L and TP = 0.28 mg/L have been required for the 22 MGD flow tier and limits of TN = 3.0 mg/L and TP = 0.22 mg/L have been required for the 28 MGD flow tier. At these annual average concentrations and design flows, the load limits will be met without the need to offset any nutrient loads.

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EVALUATION OF THE EFFLUENT – TOXICS:

WQS-WLA Spreadsheet Data

Stream: Water quality data for the receiving stream were obtained from Ambient Monitoring Station No. 1BNTH014.08 on North River located downstream of the discharge point. A Flow Frequency Determination for the receiving stream was generated August 19, 2010, and is included in Appendix A. The “Wet Season” or “High Flow” months are January through May.

Stream Information			
90% Annual Temp (°C) =	22.2	90% pH (SU) =	8.6
90% Wet Temp (°C) =	16.7	10% pH (SU) =	7.5
Mean Hardness (mg/L) =	133		

All toxic pollutants, including Ammonia-N and TRC, are assumed absent in the receiving stream because there are no data for these parameters directly above the discharge.

Discharge: The pH, temperature, and hardness values were obtained from data submitted by the permittee. In order to achieve compliance with TP limits, the facility began utilizing ferric chloride at increased rates in January 2011. Because the addition of ferric chloride affects the pH of the effluent and because the addition of ferric chloride is expected to continue in order to meet the TP limits, the pH values were established based on the pH data from the time period of January 2011 – June 2011.

Effluent Information			
90% Annual Temp (°C) =	25.4	90% pH (SU) =	7.5
90% Wet Temp (°C) =	20.8	10% pH (SU) =	7.0
Mean Hardness (mg/L) =	178		

WQC and WLAs were calculated for the WQS parameters for which data are available. The resulting WQC and WLAs are presented in this appendix. Current agency guidelines recommends the evaluation of toxic pollutant limits for TRC and Ammonia-N be based on default effluent concentrations of 20 mg/L and 9 mg/L, respectively. The effluent data were analyzed per the protocol for evaluation of effluent toxic pollutants included in this appendix with the following results:

- TRC: More stringent limits were determined to be necessary at both flow tiers. This change is due to decreased receiving stream flows and an increase in the monitoring frequency from 1/Day to 1/2 Hours, as specified by current DEQ Guidance. North River WWTF includes a dechlorination system, and as such, a schedule of compliance for meeting the more stringent limits has not been provided.
- Ammonia-N: More stringent Ammonia-N limits have been determined to be necessary at both flow tiers. This change is due to decreased receiving stream flows, an increased receiving stream 90th percentile pH, an increased effluent 90th percentile pH, and an increased effluent 90th percentile temperature. Based on the facility’s Ammonia-N effluent data combined with the fact that it is now designed to meet an annual average TN limit of 3.8 mg/L, a schedule of compliance for meeting the more stringent limits has not been provided.
- A complete WQS toxics scan has been required for the 28 MGD flow tier. This monitoring must be performed within 1 year of the issuance of the CTO for the 28 MGD facility and must be reported using Attachment A of the permit.

Fact Sheet – VPDES Permit No. VA0060640 – North River WWTF

WQC-WLA SPREADSHEET INPUT – 22 MGD

WATER QUALITY CRITERIA / WASTE LOAD ALLOCATION ANALYSIS

Facility Name:

North River WWTF

Receiving Stream:

North River

Permit No.: VA0060640

Date: 7/1/2011

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO₃) = 133 mg/L
 90% Temperature (Annual) = 22.2 deg C
 90% Temperature (Wet season) = 16.7 deg C
 90% Maximum pH = 8.6 su
 10% Maximum pH = 7.5 su
 Tier Designation =
 Public Water Supply (PWS) Y/N? =
 V(alley) or P(iedmont)? =
 Trout Present Y/N? =
 Early Life Stages Present Y/N? =

Stream Flows

1Q10 (Annual) = 10.2 MGD
 7Q10 (Annual) = 13.3 MGD
 30Q10 (Annual) = 16.5 MGD
 1Q10 (Wet season) = 26.1 MGD
 30Q10 (Wet season) = 41.3 MGD
 30Q5 = 20.3 MGD
 Harmonic Mean = 80.3 MGD

Mixing Information

Annual - 1Q10 Flow = 842 %
 - 7Q10 Flow = 100 %
 - 30Q10 Flow = 100 %
 Wet Season - 1Q10 Flow = 63.07 %
 - 30Q10 Flow = 100 %

Effluent Information

Mean Hardness (as CaCO₃) = 178 mg/L
 90% Temp (Annual) = 25.4 deg C
 90% Temp (Wet season) = 20.8 deg C
 90% Maximum pH = 7.5 su
 10% Maximum pH = 7.0 su
 Current Discharge Flow = 22 MGD
 Discharge Flow for Limit Analysis = 22 MGD

Footnotes:

- All concentrations expressed as micrograms/liter (ug/L), unless noted otherwise.
- All flow values are expressed as Million Gallons per Day (MGD).
- Discharge volumes are highest monthly average or 2C maximum for Industries and design flows for Municipal.
- Hardness expressed as mg/L CaCO₃. Standards calculated using Hardness values in the range of 25-400 mg/L CaCO₃.
- "Public Water Supply" protects for fish & water consumption. "Other Surface Waters" protects for fish consumption only.
- Carcinogen "Y" indicates carcinogenic parameter.
- Ammonia WQBs selected from separate tables, based on pH and temperature.
- Metals measured as Dissolved, unless specified otherwise.
- WLA = Waste Load Allocation (based on standards).

- WLA = Waste Load Allocation (based on standards).
- WLA's are based on mass balances (less background, if data exist).
- Acute - 1 hour avg. concentration not to be exceeded more than 1/3 years.
- Chronic - 4 day avg. concentration (30 day avg. for Ammonia) not to be exceeded more than 1/3 years.
- Mass balances employ 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens, and Harmonic Mean for Carcinogens. Actual flows employed are a function of the mixing analysis and may be less than the actual flows.
- Effluent Limitations are calculated elsewhere using the minimum WLA and EPA's statistical approach (Technical Support Document).

WQC-WLA SPREADSHEET OUTPUT – 22 MGD

Facility Name:
North River WWTF
Receiving Stream:
North River

Permit No.:
VA0060640
Date:
7/1/2011

WATER QUALITY CRITERIA

22 MGD Discharge Flow - Mix per "Mixer"

Toxic Parameter and Form	Carcinogen?	Human Health			
		Aquatic Protection		Public Water	Other Surface
		Acute	Chronic	Supplies	Waters
Acenaphthene	N	None	None	6.7E+02	9.9E+02
Acrolein	N	None	None	6.1E+00	9.3E+00
Acrylonitrile	Y	None	None	5.1E-01	2.5E+00
Aldrin	Y	3.0E+00	None	4.9E-04	5.0E-04
Ammonia-N (Annual)	N	1.6E+01 mg/L	1.9E+00 mg/L	None	None
Ammonia-N (Wet Season)	N	1.4E+01 mg/L	2.2E+00 mg/L	None	None
Anthracene	N	None	None	8.3E+03	4.0E+04
Antimony	N	None	None	5.6E+00	6.4E+02
Arsenic	N	3.4E+02	1.5E+02	1.0E+01	None
Barium	N	None	None	2.0E+03	None
Benzene	Y	None	None	2.2E+01	5.1E+02
Benzidine	Y	None	None	8.6E-04	2.0E-03
Benzo(a)anthracene	Y	None	None	3.8E-02	1.8E-01
Benzo(a)pyrene	Y	None	None	3.8E-02	1.8E-01
Benzo(b)fluoranthene	Y	None	None	3.8E-02	1.8E-01
Benzo(k)fluoranthene	Y	None	None	3.8E-02	1.8E-01
Bis(2-Chloroethyl) Ether	Y	None	None	3.0E-01	5.3E+00
Bis(2-Chloroisopropyl) Ether	N	None	None	1.4E+03	6.5E+04
Bis(2-Ethylhexyl) Phthalate	Y	None	None	1.2E+01	2.2E+01
Bromofom	Y	None	None	4.3E+01	1.4E+03
Butyl Benzyl Phthalate	N	None	None	1.5E+03	1.9E+03
Cadmium	N	6.9E+00	1.6E+00	5.0E+00	None
Carbon Tetrachloride	Y	None	None	2.3E+00	1.6E+01
Chlordane	Y	2.4E+00	4.3E-03	8.0E-03	8.1E-03
Chloride	N	8.6E+02 mg/L	2.3E+02 mg/L	2.5E+02 mg/L	None
Chlorine, Total Residual	N	1.9E-02 mg/L	1.1E-02 mg/L	None	None
Chlorobenzene	N	None	None	1.3E+02	1.6E+03
Chlorodibromomethane	Y	None	None	4.0E+00	1.3E+02
Chloroform	N	None	None	3.4E+02	1.1E+04
2-Chloronaphthalene	N	None	None	1.0E+03	1.6E+03
2-Chlorophenol	N	None	None	8.1E+01	1.5E+02
Chlorpyrifos	N	8.3E-02	4.1E-02	None	None
Chromium(+3)	N	8.6E+02	1.1E+02	None	None
Chromium(+6)	N	1.6E+01	1.1E+01	None	None
Total Chromium	N	None	None	1.0E+02	None
Chrysene	Y	None	None	4.4E-02	4.9E-01
Copper	N	2.2E+01	1.3E+01	1.3E+03	None
Cyanide, Free	N	2.2E+01	5.2E+00	1.4E+02	1.6E+04
DDD	Y	None	None	3.1E-03	3.1E-03
DDE	Y	None	None	2.2E-03	2.2E-03
DDT	Y	1.1E+00	1.0E-03	2.2E-03	2.2E-03
Demeton	N	None	1.0E-01	None	None
Diazinon	N	1.7E-01	1.7E-01	None	None
Dibenz(a,h)anthracene	Y	None	None	3.8E-02	1.8E-01
1,2-Dichlorobenzene	N	None	None	4.2E+02	1.3E+03
1,3-Dichlorobenzene	N	None	None	3.2E+02	9.6E+02
1,4-Dichlorobenzene	N	None	None	6.3E+01	1.9E+02
3,3-Dichlorobenzidine	Y	None	None	2.1E-01	2.8E-01
Dichlorobromomethane	Y	None	None	5.5E+00	1.7E+02
1,2-Dichloroethane	Y	None	None	3.8E+00	3.7E+02
1,1-Dichloroethylene	N	None	None	3.3E+02	7.1E+03
1,2-trans-dichloroethylene	N	None	None	1.4E+02	1.0E+04
2,4-Dichlorophenol	N	None	None	7.7E+01	2.9E+02
2,4-Dichlorophenoxy Acetic Acid	N	None	None	1.0E+02	None
1,2-Dichloropropane	Y	None	None	5.0E+00	1.5E+02
1,3-Dichloropropene	Y	None	None	3.4E+00	2.1E+02
Dieldrin	Y	2.4E-01	5.6E-02	5.2E-04	5.4E-04

NON-ANTIDEGRADATION WASTE LOAD ALLOCATIONS

22 MGD Discharge - Mix per "Mixer"

Toxic Parameter and Form	Carcinogen?	Human Health		
		Aquatic Protection		Human
		Acute	Chronic	Health
Acenaphthene	N	N/A	N/A	1.9E+03
Acrolein	N	N/A	N/A	1.8E+01
Acrylonitrile	Y	N/A	N/A	1.2E+01
Aldrin	Y	4.2E+00	N/A	2.3E-03
Ammonia-N (Annual)	N	2.3E+01 mg/L	3.3E+00 mg/L	N/A
Ammonia-N (Wet Season)	N	2.5E+01 mg/L	6.4E+00 mg/L	N/A
Anthracene	N	N/A	N/A	7.7E+04
Antimony	N	N/A	N/A	1.2E+03
Arsenic	N	4.7E+02	2.4E+02	N/A
Barium	N	N/A	N/A	N/A
Benzene	Y	N/A	N/A	2.4E+03
Benzidine	Y	N/A	N/A	9.3E-03
Benzo(a)anthracene	Y	N/A	N/A	8.4E-01
Benzo(a)pyrene	Y	N/A	N/A	8.4E-01
Benzo(b)fluoranthene	Y	N/A	N/A	8.4E-01
Benzo(k)fluoranthene	Y	N/A	N/A	8.4E-01
Bis(2-Chloroethyl) Ether	Y	N/A	N/A	2.5E+01
Bis(2-Chloroisopropyl) Ether	N	N/A	N/A	1.2E+05
Bis(2-Ethylhexyl) Phthalate	Y	N/A	N/A	1.0E+02
Bromofom	Y	N/A	N/A	6.5E+03
Butyl Benzyl Phthalate	N	N/A	N/A	3.7E+03
Cadmium	N	9.6E+00	2.6E+00	N/A
Carbon Tetrachloride	Y	N/A	N/A	7.4E+01
Chlordane	Y	3.3E+00	6.9E-03	3.8E-02
Chloride	N	1.2E+03 mg/L	3.7E+02 mg/L	N/A
Chlorine, Total Residual	N	2.6E-02 mg/L	1.8E-02 mg/L	N/A
Chlorobenzene	N	N/A	N/A	3.1E+03
Chlorodibromomethane	Y	N/A	N/A	6.0E+02
Chloroform	N	N/A	N/A	2.1E+04
2-Chloronaphthalene	N	N/A	N/A	3.1E+03
2-Chlorophenol	N	N/A	N/A	2.9E+02
Chlorpyrifos	N	1.2E-01	6.6E-02	N/A
Chromium(+3)	N	1.2E+03	1.8E+02	N/A
Chromium(+6)	N	2.2E+01	1.8E+01	N/A
Total Chromium	N	N/A	N/A	N/A
Chrysene	Y	N/A	N/A	2.3E+00
Copper	N	3.0E+01	2.2E+01	N/A
Cyanide, Free	N	3.1E+01	8.3E+00	3.1E+04
DDD	Y	N/A	N/A	1.4E-02
DDE	Y	N/A	N/A	1.0E-02
DDT	Y	1.5E+00	1.6E-03	1.0E-02
Demeton	N	N/A	1.6E-01	N/A
Diazinon	N	2.4E-01	2.7E-01	N/A
Dibenz(a,h)anthracene	Y	N/A	N/A	8.4E-01
1,2-Dichlorobenzene	N	N/A	N/A	2.5E+03
1,3-Dichlorobenzene	N	N/A	N/A	1.8E+03
1,4-Dichlorobenzene	N	N/A	N/A	3.7E+02
3,3-Dichlorobenzidine	Y	N/A	N/A	1.3E+00
Dichlorobromomethane	Y	N/A	N/A	7.9E+02
1,2-Dichloroethane	Y	N/A	N/A	1.7E+03
1,1-Dichloroethylene	N	N/A	N/A	1.4E+04
1,2-trans-dichloroethylene	N	N/A	N/A	1.9E+04
2,4-Dichlorophenol	N	N/A	N/A	5.6E+02
2,4-Dichlorophenoxy Acetic Acid	N	N/A	N/A	N/A
1,2-Dichloropropane	Y	N/A	N/A	7.0E+02
1,3-Dichloropropene	Y	N/A	N/A	9.8E+02
Dieldrin	Y	3.3E-01	9.0E-02	2.5E-03

Fact Sheet – VPDES Permit No. VA0060640 – North River WWTF

Facility Name:		Permit No.:						
North River WWTF		VA0060640						
Receiving Stream:		Date:						
North River		7/1/2011						
		WATER QUALITY CRITERIA				NON-ANTIDegradation		
		22 MGD Discharge Flow - Mix per "Mixer"				WASTE LOAD ALLOCATIONS		
				Human Health				
		Aquatic Protection		Public Water	Other Surface	Aquatic Protection		Human
Toxic Parameter and Form	Carcinogen?	Acute	Chronic	Supplies	Waters	Acute	Chronic	Health
Diethyl Phthalate	N	None	None	1.7E+04	4.4E+04	N/A	N/A	8.5E+04
2,4 Dimethylphenol	N	None	None	3.8E+02	8.5E+02	N/A	N/A	1.6E+03
Dimethyl Phthalate	N	None	None	2.7E+05	1.1E+06	N/A	N/A	2.1E+06
Di-n-Butyl Phthalate	N	None	None	2.0E+03	4.5E+03	N/A	N/A	8.7E+03
2,4 Dinitrophenol	N	None	None	6.9E+01	5.3E+03	N/A	N/A	1.0E+04
2-Methyl-4,6-Dinitrophenol	N	None	None	1.3E+01	2.8E+02	N/A	N/A	5.4E+02
2,4-Dinitrotoluene	Y	None	None	1.1E+00	3.4E+01	N/A	N/A	1.6E+02
Dioxin +	N	None	None	5.0E-08	5.1E-08	N/A	N/A	9.8E-08
1,2-Diphenylhydrazine	Y	None	None	3.6E-01	2.0E+00	N/A	N/A	9.3E+00
Alpha-Endosulfan	N	2.2E-01	5.6E-02	6.2E+01	8.9E+01	3.1E-01	9.0E-02	1.7E+02
Beta-Endosulfan	N	2.2E-01	5.6E-02	6.2E+01	8.9E+01	3.1E-01	9.0E-02	1.7E+02
Alpha+Beta-Endosulfan	N	2.2E-01	5.6E-02	None	None	3.1E-01	9.0E-02	N/A
Endosulfan Sulfate	N	None	None	6.2E+01	8.9E+01	N/A	N/A	1.7E+02
Endrin	N	8.6E-02	3.6E-02	5.9E-02	6.0E-02	1.2E-01	5.8E-02	1.2E-01
Endrin Aldehyde	N	None	None	2.9E-01	3.0E-01	N/A	N/A	5.8E-01
Ethylbenzene	N	None	None	5.3E+02	2.1E+03	N/A	N/A	4.0E+03
Fluoranthene	N	None	None	1.3E+02	1.4E+02	N/A	N/A	2.7E+02
Fluorene	N	None	None	1.1E+03	5.3E+03	N/A	N/A	1.0E+04
Foaming Agents (MBAS)	N	None	None	5.0E+02	None	N/A	N/A	N/A
Guthion	N	None	1.0E-02	None	None	N/A	1.6E-02	N/A
Heptachlor	Y	5.2E-01	3.8E-03	7.9E-04	7.9E-04	7.2E-01	6.1E-03	3.7E-03
Heptachlor Epoxide	Y	5.2E-01	3.8E-03	3.9E-04	3.9E-04	7.2E-01	6.1E-03	1.8E-03
Hexachlorobenzene	Y	None	None	2.8E-03	2.9E-03	N/A	N/A	1.3E-02
Hexachlorobutadiene	Y	None	None	4.4E+00	1.8E+02	N/A	N/A	8.4E+02
Hexachlorocyclohexane Alpha-BHC	Y	None	None	2.6E-02	4.9E-02	N/A	N/A	2.3E-01
Hexachlorocyclohexane Beta-BHC	Y	None	None	9.1E-02	1.7E-01	N/A	N/A	7.9E-01
Hexachlorocyclohexane Gamma-BHC (Lindane)	Y	9.5E-01	None	9.8E-01	1.8E+00	1.3E+00	N/A	8.4E+00
Hexachlorocyclopentadiene	N	None	None	4.0E+01	1.1E+03	N/A	N/A	2.1E+03
Hexachloroethane	Y	None	None	1.4E+01	3.3E+01	N/A	N/A	1.5E+02
Hydrogen Sulfide	N	None	2.0E+00	None	None	N/A	3.2E+00	N/A
Indeno(1,2,3-cd)pyrene	Y	None	None	3.8E-02	1.8E-01	N/A	N/A	8.4E-01
Iron	N	None	None	3.0E+02	None	N/A	N/A	N/A
Isophorone	Y	None	None	3.5E+02	9.6E+03	N/A	N/A	4.5E+04
Kepone	N	None	Zero	None	None	N/A	Zero	N/A
Lead	N	2.3E+02	2.5E+01	1.5E+01	None	3.1E+02	4.0E+01	N/A
Malathion	N	None	1.0E-01	None	None	N/A	1.6E-01	N/A
Manganese	N	None	None	5.0E+01	None	N/A	N/A	N/A
Mercury	N	1.4E+00	7.7E-01	None	None	1.9E+00	1.2E+00	N/A
Methyl Bromide	N	None	None	4.7E+01	1.5E+03	N/A	N/A	2.9E+03
Methylene Chloride	Y	None	None	4.6E+01	5.9E+03	N/A	N/A	2.7E+04
Methoxychlor	N	None	3.0E-02	1.0E+02	None	N/A	4.8E-02	N/A
Mirex	N	None	Zero	None	None	N/A	Zero	N/A
Nickel	N	2.8E+02	3.0E+01	6.1E+02	4.6E+03	3.9E+02	4.9E+01	8.8E+03
Nitrate (as N)	N	None	None	1.0E+01 mg/L	None	N/A	N/A	N/A
Nitrobenzene	N	None	None	1.7E+01	6.9E+02	N/A	N/A	1.3E+03
N-Nitrosodimethylamine	Y	None	None	6.9E-03	3.0E+01	N/A	N/A	1.4E+02
N-Nitrosodiphenylamine	Y	None	None	3.3E+01	6.0E+01	N/A	N/A	2.8E+02
N-Nitrosodi-n-propylamine	Y	None	None	5.0E-02	5.1E+00	N/A	N/A	2.4E+01
Nonylphenol	N	2.8E+01	6.6E+00	None	None	3.9E+01	1.1E+01	N/A
Parathion	N	6.5E-02	1.3E-02	None	None	9.0E-02	2.1E-02	N/A
PCB Total	Y	None	1.4E-02	6.4E-04	6.4E-04	N/A	2.2E-02	3.0E-03
Pentachlorophenol	Y	9.6E+00	7.6E+00	2.7E+00	3.0E+01	1.3E+01	1.2E+01	1.4E+02
Phenol	N	None	None	1.0E+04	8.6E+05	N/A	N/A	1.7E+06
Pyrene	N	None	None	8.3E+02	4.0E+03	N/A	N/A	7.7E+03
RadNuc - Beta Part & Photon Act	N	None	None	4.0E+00 mrem	4.0E+00 mrem	N/A	N/A	7.7E+00
RadNuc - Gross Alpha Part Act	N	None	None	1.5E+01 pCi/L	None	N/A	N/A	N/A
RadNuc - Radium 226 + 228	N	None	None	5.0E+00 pCi/L	None	N/A	N/A	N/A
RadNuc - Uranium	N	None	None	3.0E+01	None	N/A	N/A	N/A
Selenium, Total Recoverable	N	2.0E+01	5.0E+00	1.7E+02	4.2E+03	2.8E+01	8.0E+00	8.1E+03
Silver	N	8.2E+00	None	None	None	1.1E+01	N/A	N/A
Sulfate	N	None	None	2.5E+02 mg/L	None	N/A	N/A	N/A
1,1,2,2-Tetrachloroethane	Y	None	None	1.7E+00	4.0E+01	N/A	N/A	1.9E+02
Tetrachloroethylene	Y	None	None	6.9E+00	3.3E+01	N/A	N/A	1.5E+02
Thallium	N	None	None	2.4E-01	4.7E-01	N/A	N/A	9.0E-01
Toluene	N	None	None	5.1E+02	6.0E+03	N/A	N/A	1.2E+04
Total Dissolved Solids	N	None	None	5.0E+05	None	N/A	N/A	N/A
Toxaphene	Y	7.3E-01	2.0E-04	2.8E-03	2.8E-03	1.0E+00	3.2E-04	1.3E-02
Tributyltin	N	4.6E-01	7.2E-02	None	None	6.4E-01	1.2E-01	N/A
1,2,4-Trichlorobenzene	N	None	None	3.5E+01	7.0E+01	N/A	N/A	1.3E+02
1,1,2-Trichloroethane	Y	None	None	5.9E+00	1.6E+02	N/A	N/A	7.4E+02
Trichloroethylene	Y	None	None	2.5E+01	3.0E+02	N/A	N/A	1.4E+03
2,4,6-Trichlorophenol	Y	None	None	1.4E+01	2.4E+01	N/A	N/A	1.1E+02
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	N	None	None	5.0E+01	None	N/A	N/A	N/A
Vinyl Chloride	Y	None	None	2.5E-01	2.4E+01	N/A	N/A	1.1E+02
Zinc	N	1.8E+02	1.8E+02	7.4E+03	2.6E+04	2.5E+02	2.8E+02	5.0E+04

Fact Sheet – VPDES Permit No. VA0060640 – North River WWTF

WQC-WLA SPREADSHEET INPUT – 28 MGD

WATER QUALITY CRITERIA / WASTE LOAD ALLOCATION ANALYSIS

Facility Name:	North River WWTF	Permit No.:	VA0060640	Version:	OWP Guidance Memo 00-2011 (8/24/00)
Receiving Stream:	North River	Date:	7/1/2011		
Stream Information	Stream Flows	Mixing Information	Effluent Information		
Mean Hardness (as CaCO ₃) =	133 mg/L	Annual - 1Q10 Flow =	98.51 %	Mean Hardness (as CaCO ₃) =	178 mg/L
90% Temperature (Annual) =	22.2 deg C	- 7Q10 Flow =	100 %	90% Temp (Annual) =	25.4 deg C
90% Temperature (Wet season) =	16.7 deg C	- 3Q10 Flow =	100 %	90% Temp (Wet season) =	20.8 deg C
90% Maximum pH =	8.6 SU	Wet Season - 1Q10 Flow =	70.24 %	90% Maximum pH =	7.5 SU
10% Maximum pH =	7.5 SU	- 3Q10 Flow =	100 %	10% Maximum pH =	7.0 SU
Tier Designation =	N			Current Discharge Flow =	28 MGD
Public Water Supply (PWS) Y/N? =	N			Discharge Flow for Limit Analysis =	28 MGD
V(alley) or P(edmont)? =	N				
Trout Present Y/N? =	N				
Early Life Stages Present Y/N? =	Y				

Footnotes:

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise.
- All flow values are expressed as Million Gallons per Day (MGD).
- Discharge volumes are highest monthly average or 2C maximum for Industries and design flows for Municipals.
- Hardness expressed as mg/l CaCO₃. Standards calculated using Hardness values in the range of 25-400 mg/l CaCO₃.
- "Public Water Supply" protects for fish & water consumption. "Other Surface Waters" protects for fish consumption only.
- Carcinogen "Y" indicates carcinogenic parameter.
- Ammonia WQGs selected from separate tables, based on pH and temperature.
- Metals measured as Dissolved, unless specified otherwise.
- WLA = Waste Load Allocation (based on standards).
- WLA = Waste Load Allocation (based on standards).
- WLAs are based on mass balances (less background, if data exist).
- Acute - 1 hour avg. concentration not to be exceeded more than 1/3 years.
- Chronic - 4 day avg. concentration (30 day avg. for Ammonia) not to be exceeded more than 1/3 years.
- Mass balances employ 1Q10 for Acute, 3Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 3Q05 for Non-carcinogens, and Harmonic Mean for Carcinogens. Actual flows employed are a function of the mixing analysis and may be less than the actual flows.
- Effluent Limitations are calculated elsewhere using the minimum WLA and EPA's statistical approach (Technical Support Document).

WQC-WLA SPREADSHEET OUTPUT – 28 MGD

Facility Name:	North River WWTF	Permit No.:	VA0060640	WATER QUALITY CRITERIA				NON-ANTIDEGRADATION WASTE LOAD ALLOCATIONS			
Receiving Stream:	North River	Date:	7/1/2011	28 MGD Discharge Flow - Mix per "Mixer"				28 MGD Discharge - Mix per "Mixer"			
				Aquatic Protection		Human Health		Aquatic Protection		Human Health	
				Acute	Chronic	Public Water Supplies	Other Surface Waters	Acute	Chronic	Human Health	
Toxic Parameter and Form	Carcinogen?										
Acenaphthene	N			None	None	6.7E+02	9.9E+02	N/A	N/A	1.7E+03	
Acrolein	N			None	None	6.1E+00	9.3E+00	N/A	N/A	1.6E+01	
Acrylonitrile	Y			None	None	5.1E-01	2.5E+00	N/A	N/A	9.7E+00	
Aldrin	Y			3.0E+00	None	4.9E-04	5.0E-04	4.1E+00	N/A	1.9E-03	
Ammonia-N (Annual)	N			1.6E+01 mg/L	2.0E+00 mg/L	None	None	2.2E+01 mg/L	3.1E+00 mg/L	N/A	
Ammonia-N (Wet Season)	N			1.5E+01 mg/L	2.3E+00 mg/L	None	None	2.4E+01 mg/L	5.8E+00 mg/L	N/A	
Anthracene	N			None	None	8.3E+03	4.0E+04	N/A	N/A	6.9E+04	
Antimony	N			None	None	5.6E+00	6.4E+02	N/A	N/A	1.1E+03	
Arsenic	N			3.4E+02	1.5E+02	1.0E+01	None	4.6E+02	2.2E+02	N/A	
Barium	N			None	None	2.0E+03	None	N/A	N/A	N/A	
Benzene	Y			None	None	2.2E+01	5.1E+02	N/A	N/A	2.0E+03	
Benzidine	Y			None	None	8.6E-04	2.0E-03	N/A	N/A	7.7E-03	
Benzo(a)anthracene	Y			None	None	3.8E-02	1.8E-01	N/A	N/A	7.0E-01	
Benzo(a)pyrene	Y			None	None	3.8E-02	1.8E-01	N/A	N/A	7.0E-01	
Benzo(b)fluoranthene	Y			None	None	3.8E-02	1.8E-01	N/A	N/A	7.0E-01	
Benzo(k)fluoranthene	Y			None	None	3.8E-02	1.8E-01	N/A	N/A	7.0E-01	
Bis(2-Chloroethyl) Ether	Y			None	None	3.0E-01	5.3E+00	N/A	N/A	2.0E+01	
Bis(2-Chloroisopropyl) Ether	N			None	None	1.4E+03	6.5E+04	N/A	N/A	1.1E+05	
Bis(2-Ethylhexyl) Phthalate	Y			None	None	1.2E+01	2.2E+01	N/A	N/A	8.5E+01	
Bromoform	Y			None	None	4.3E+01	1.4E+03	N/A	N/A	5.4E+03	
Butyl Benzyl Phthalate	N			None	None	1.5E+03	1.9E+03	N/A	N/A	3.3E+03	
Cadmium	N			7.0E+00	1.7E+00	5.0E+00	None	9.4E+00	2.5E+00	N/A	
Carbon Tetrachloride	Y			None	None	2.3E+00	1.6E+01	N/A	N/A	6.2E+01	
Chlordane	Y			2.4E+00	4.3E-03	8.0E-03	8.1E-03	3.3E+00	6.3E-03	3.1E-02	
Chloride	N			8.6E+02 mg/L	2.3E+02 mg/L	2.5E+02 mg/L	None	1.2E+03 mg/L	3.4E+02 mg/L	N/A	
Chlorine, Total Residual	N			1.9E-02 mg/L	1.1E-02 mg/L	None	None	2.6E-02 mg/L	1.6E-02 mg/L	N/A	
Chlorobenzene	N			None	None	1.3E+02	1.6E+03	N/A	N/A	2.8E+03	
Chlorodibromomethane	Y			None	None	4.0E+00	1.3E+02	N/A	N/A	5.0E+02	
Chloroform	N			None	None	3.4E+02	1.1E+04	N/A	N/A	1.9E+04	
2-Chloronaphthalene	N			None	None	1.0E+03	1.6E+03	N/A	N/A	2.8E+03	
2-Chlorophenol	N			None	None	8.1E+01	1.5E+02	N/A	N/A	2.6E+02	
Chlorpyrifos	N			8.3E-02	4.1E-02	None	None	1.1E-01	6.0E-02	N/A	
Chromium(+3)	N			8.6E+02	1.1E+02	None	None	1.2E+03	1.6E+02	N/A	
Chromium(+6)	N			1.6E+01	1.1E+01	None	None	2.2E+01	1.6E+01	N/A	
Total Chromium	N			None	None	1.0E+02	None	N/A	N/A	N/A	
Chrysene	Y			None	None	4.4E-02	4.9E-01	N/A	N/A	1.9E+00	
Copper	N			2.2E+01	1.4E+01	1.3E+03	None	2.9E+01	2.0E+01	N/A	
Cyanide, Free	N			2.2E+01	5.2E+00	1.4E+02	1.6E+04	3.0E+01	7.7E+00	2.8E+04	
DDD	Y			None	None	3.1E-03	3.1E-03	N/A	N/A	1.2E-02	
DDE	Y			None	None	2.2E-03	2.2E-03	N/A	N/A	8.5E-03	
DDT	Y			1.1E+00	1.0E-03	2.2E-03	2.2E-03	1.5E+00	1.5E-03	8.5E-03	
Demeton	N			None	1.0E-01	None	None	N/A	1.5E-01	N/A	
Diazinon	N			1.7E-01	1.7E-01	None	None	2.3E-01	2.5E-01	N/A	
Dibenz(a,h)anthracene	Y			None	None	3.8E-02	1.8E-01	N/A	N/A	7.0E-01	
1,2-Dichlorobenzene	N			None	None	4.2E+02	1.3E+03	N/A	N/A	2.2E+03	
1,3-Dichlorobenzene	N			None	None	3.2E+02	9.6E+02	N/A	N/A	1.7E+03	
1,4-Dichlorobenzene	N			None	None	6.3E+01	1.9E+02	N/A	N/A	3.3E+02	
3,3-Dichlorobenzidine	Y			None	None	2.1E-01	2.8E-01	N/A	N/A	1.1E+00	
Dichlorobromomethane	Y			None	None	5.5E+00	1.7E+02	N/A	N/A	6.6E+02	
1,2-Dichloroethane	Y			None	None	3.8E+00	3.7E+02	N/A	N/A	1.4E+03	
1,1-Dichloroethylene	N			None	None	3.3E+02	7.1E+03	N/A	N/A	1.2E+04	
1,2-trans-dichloroethylene	N			None	None	1.4E+02	1.0E+04	N/A	N/A	1.7E+04	
2,4-Dichlorophenol	N			None	None	7.7E+01	2.9E+02	N/A	N/A	5.0E+02	
2,4-Dichlorophenoxy Acetic Acid	N			None	None	1.0E+02	None	N/A	N/A	N/A	
1,2-Dichloropropane	Y			None	None	5.0E+00	1.5E+02	N/A	N/A	5.8E+02	
1,3-Dichloropropene	Y			None	None	3.4E+00	2.1E+02	N/A	N/A	8.1E+02	
Dieldrin	Y			2.4E-01	5.6E-02	5.2E-04	5.4E-04	3.3E-01	8.3E-02	2.1E-03	

Fact Sheet – VPDES Permit No. VA0060640 – North River WWTF

Facility Name: North River WWTF		Permit No.: VA0060640		WATER QUALITY CRITERIA		NON-ANTIDEGRADATION WASTE LOAD ALLOCATIONS	
Receiving Stream: North River		Date: 7/1/2011		28 MGD Discharge Flow - Mix per "Mixer"		28 MGD Discharge - Mix per "Mixer"	
Toxic Parameter and Form	Carcinogen?	Aquatic Protection		Human Health		Aquatic Protection	
		Acute	Chronic	Public Water Supplies	Other Surface Waters	Acute	Human Health
Diethyl Phthalate	N	None	None	1.7E+04	4.4E+04	N/A	N/A
2,4 Dimethylphenol	N	None	None	3.8E+02	8.5E+02	N/A	N/A
Dimethyl Phthalate	N	None	None	2.7E+05	1.1E+06	N/A	N/A
Di-n-Butyl Phthalate	N	None	None	2.0E+03	4.5E+03	N/A	N/A
2,4 Dinitrophenol	N	None	None	6.9E+01	5.3E+03	N/A	N/A
2-Methyl-4,6-Dinitrophenol	N	None	None	1.3E+01	2.8E+02	N/A	N/A
2,4-Dinitrotoluene	Y	None	None	1.1E+00	3.4E+01	N/A	N/A
Dioxin +	N	None	None	5.0E-08	5.1E-08	N/A	N/A
1,2-Diphenylhydrazine	Y	None	None	3.6E-01	2.0E+00	N/A	N/A
Alpha-Endosulfan	N	2.2E-01	5.6E-02	6.2E+01	8.9E+01	3.0E-01	8.3E-02
Beta-Endosulfan	N	2.2E-01	5.6E-02	6.2E+01	8.9E+01	3.0E-01	8.3E-02
Alpha+Beta-Endosulfan	N	2.2E-01	5.6E-02	None	None	3.0E-01	8.3E-02
Endosulfan Sulfate	N	None	None	6.2E+01	8.9E+01	N/A	N/A
Endrin	N	8.6E-02	3.6E-02	5.9E-02	6.0E-02	1.2E-01	5.3E-02
Endrin Aldehyde	N	None	None	2.9E-01	3.0E-01	N/A	N/A
Ethylbenzene	N	None	None	5.3E+02	2.1E+03	N/A	N/A
Fluoranthene	N	None	None	1.3E+02	1.4E+02	N/A	N/A
Fluorene	N	None	None	1.1E+03	5.3E+03	N/A	N/A
Foaming Agents (MBAS)	N	None	None	5.0E+02	None	N/A	N/A
Guthion	N	None	1.0E-02	None	None	N/A	1.5E-02
Heptachlor	Y	5.2E-01	3.8E-03	7.9E-04	7.9E-04	7.1E-01	5.6E-03
Heptachlor Epoxide	Y	5.2E-01	3.8E-03	3.9E-04	3.9E-04	7.1E-01	5.6E-03
Hexachlorobenzene	Y	None	None	2.8E-03	2.9E-03	N/A	N/A
Hexachlorobutadiene	Y	None	None	4.4E+00	1.8E+02	N/A	N/A
Hexachlorocyclohexane Alpha-BHC	Y	None	None	2.6E-02	4.9E-02	N/A	N/A
Hexachlorocyclohexane Beta-BHC	Y	None	None	9.1E-02	1.7E-01	N/A	N/A
Hexachlorocyclohexane Gamma-BHC (Lindane)	Y	9.5E-01	None	9.8E-01	1.8E+00	1.3E+00	N/A
Hexachlorocyclopentadiene	N	None	None	4.0E+01	1.1E+03	N/A	N/A
Hexachloroethane	Y	None	None	1.4E+01	3.3E+01	N/A	N/A
Hydrogen Sulfide	N	None	2.0E+00	None	None	N/A	3.0E+00
Indeno(1,2,3-cd)pyrene	Y	None	None	3.8E-02	1.8E-01	N/A	N/A
Iron	N	None	None	3.0E+02	None	N/A	N/A
Isophorone	Y	None	None	3.5E+02	9.6E+03	N/A	N/A
Kepon	N	None	Zero	None	None	N/A	Zero
Lead	N	2.3E+02	2.5E+01	1.5E+01	None	3.1E+02	3.7E+01
Malathion	N	None	1.0E-01	None	None	N/A	1.5E-01
Manganese	N	None	None	5.0E+01	None	N/A	N/A
Mercury	N	1.4E+00	7.7E-01	None	None	1.9E+00	1.1E+00
Methyl Bromide	N	None	None	4.7E+01	1.5E+03	N/A	N/A
Methylene Chloride	Y	None	None	4.6E+01	5.9E+03	N/A	N/A
Methoxychlor	N	None	3.0E-02	1.0E+02	None	N/A	4.4E-02
Mirex	N	None	Zero	None	None	N/A	Zero
Nickel	N	2.8E+02	3.1E+01	6.1E+02	4.6E+03	3.8E+02	4.5E+01
Nitrate (as N)	N	None	None	1.0E+01 mg/L	None	N/A	N/A
Nitrobenzene	N	None	None	1.7E+01	6.9E+02	N/A	N/A
N-Nitrosodimethylamine	Y	None	None	6.9E-03	3.0E+01	N/A	N/A
N-Nitrosodiphenylamine	Y	None	None	3.3E+01	6.0E+01	N/A	N/A
N-Nitrosodi-n-propylamine	Y	None	None	5.0E-02	5.1E+00	N/A	N/A
Nonylphenol	N	2.8E+01	6.6E+00	None	None	3.8E+01	9.7E+00
Parathion	N	6.5E-02	1.3E-02	None	None	8.8E-02	1.9E-02
PCB Total	Y	None	1.4E-02	6.4E-04	6.4E-04	N/A	2.1E-02
Pentachlorophenol	Y	9.5E+00	7.5E+00	2.7E+00	3.0E+01	1.3E+01	1.1E+01
Phenol	N	None	None	1.0E+04	8.6E+05	N/A	N/A
Pyrene	N	None	None	8.3E+02	4.0E+03	N/A	N/A
RadNuc - Beta Part & Photon Act	N	None	None	4.0E+00 mem	4.0E+00 mem	N/A	N/A
RadNuc - Gross Alpha Part Act	N	None	None	1.5E+01 pCi/L	None	N/A	N/A
RadNuc - Radium 226 + 228	N	None	None	5.0E+00 pCi/L	None	N/A	N/A
RadNuc - Uranium	N	None	None	3.0E+01	None	N/A	N/A
Selenium, Total Recoverable	N	2.0E+01	5.0E+00	1.7E+02	4.2E+03	2.7E+01	7.4E+00
Silver	N	8.3E+00	None	None	None	1.1E+01	N/A
Sulfate	N	None	None	2.5E+02 mg/L	None	N/A	N/A
1,1,2,2-Tetrachloroethane	Y	None	None	1.7E+00	4.0E+01	N/A	N/A
Tetrachloroethylene	Y	None	None	6.9E+00	3.3E+01	N/A	N/A
Thallium	N	None	None	2.4E-01	4.7E-01	N/A	N/A
Toluene	N	None	None	5.1E+02	6.0E+03	N/A	N/A
Total Dissolved Solids	N	None	None	5.0E+05	None	N/A	N/A
Toxaphene	Y	7.3E-01	2.0E-04	2.8E-03	2.8E-03	9.9E-01	3.0E-04
Tributyltin	N	4.6E-01	7.2E-02	None	None	6.3E-01	1.1E-01
1,2,4-Trichlorobenzene	N	None	None	3.5E+01	7.0E+01	N/A	N/A
1,1,2-Trichloroethane	Y	None	None	5.9E+00	1.6E+02	N/A	N/A
Trichloroethylene	Y	None	None	2.5E+01	3.0E+02	N/A	N/A
2,4,6-Trichlorophenol	Y	None	None	1.4E+01	2.4E+01	N/A	N/A
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	N	None	None	5.0E+01	None	N/A	N/A
Vinyl Chloride	Y	None	None	2.5E-01	2.4E+01	N/A	N/A
Zinc	N	1.8E+02	1.8E+02	7.4E+03	2.6E+04	2.4E+02	2.6E+02

Fact Sheet – VPDES Permit No. VA0060640 – North River WWTF

PROTOCOL FOR THE EVALUATION OF THE EFFLUENT – TOXIC POLLUTANTS

Toxic pollutants were evaluated in accordance with OWP Guidance Memo No. 00-2011. Acute and Chronic Waste Load Allocations (WLA_a and WLA_c) were analyzed according to the protocol below using a statistical approach (STAT.exe) to determine the necessity and magnitude of limits. Human Health Waste Load Allocations (WLA_{hh}) were analyzed according to the same protocol through a simple comparison with the effluent data. If the WLA_{hh} exceeded the effluent datum or data mean, no limits were required. If the effluent datum or data mean exceeded the WLA_{hh} , the WLA_{hh} was imposed as the limit. Since there are no data available immediately upstream of this discharge, all other upstream (background) pollutant concentrations are assumed to be "0".

The steps used in evaluating the effluent data are as follows:

- A. If all data are reported as "below detection" or $<$ the required Quantification Level (QL), and at least one detection level is $=$ the required QL, then the pollutant is considered to be not significantly present in the discharge and no further monitoring is required.
 - * The required QL was 10.0 ug/L. Three samples were collected and the QLs utilized were 10.4 ug/L, 10.4 ug/L, and 10.6 ug/L. All three results were reported as $=$ the respective QL. Although none of the detection levels were $=$ the required QL, because the detection levels were very close to the required QL for all three samples, the pollutant is considered to be not significantly present in the discharge and no further monitoring is required.
 - ** The required QL was 5.0 ug/L. One sample was collected and the QL utilized was 5.29 ug/L. The result was reported as $=$ the QL. Although the detection level was not $=$ the required QL, because the detection level was very close to the required QL, the pollutant is considered to be not significantly present in the discharge and no further monitoring is required.
- B. If all data are reported as "below detection", and all detection levels are $>$ the required QL, then an evaluation is performed in which the pollutant is assumed present at the lowest reported detection level.
 - B.1. If the evaluation indicates that no limits are needed, then the existing data set is adequate and no further monitoring is required.
 - B.2. If the evaluation indicates that limits are needed, then the existing data set is inadequate to make a determination and additional monitoring is required.
- C. If any data value is reported as detectable at or above the required QL, then the data are adequate to determine whether effluent limits are needed.
 - C.1. If the evaluation indicates that no limits are needed, then no further monitoring is required.
 - C.2. If the evaluation indicates that limits are needed, then the limits and associated requirements are specified in the draft permit.
 - C.3. If the evaluation indicates that limits are needed, but the metals data are reported as a form other than "Dissolved", then the existing data set is inadequate to make a determination and additional monitoring is required.

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TOXLARGE – 22 MGD Flow Tier

Parameter	CASRN	QL (ug/L)	Data (ug/L unless noted otherwise)	Source of Data	Data Eval
METALS					
Antimony, dissolved	7440-36-0	0.2	<200	a	B.1
Arsenic, dissolved	7440-38-2	1.0	<200, <20.0	a,b	B.1
Barium, dissolved	7440-39-3	---	Applicable to PWS waters only	---	---
Cadmium, dissolved	7440-43-9	0.3	<20, <0.1	a,b	A
Chromium III, dissolved	16065-83-1	0.5	<10, <5.0	a,b	B.1
Chromium VI, dissolved	18540-29-9	0.5	<10, <5.0	a,b	B.1
Chromium, Total	7440-47-3	---	Applicable to PWS waters only	---	---
Copper, dissolved	7440-50-8	0.5	<100, <1.0	a,b	B.1
Iron, dissolved	7439-89-6	1.0	Applicable to PWS waters only	---	---
Lead, dissolved	7439-92-1	0.5	<200, <1.0	a,b	B.1
Manganese, dissolved	7439-96-5	0.2	Applicable to PWS waters only	---	---
Mercury, dissolved	7439-97-6	1.0	<1	a	A
Nickel, dissolved	7440-02-0	0.5	<100, <2.0	a,b	B.1
Selenium, total recoverable	7782-49-2	2.0	<200, <2.0	a,b	A
Silver, dissolved	7440-22-4	0.2	<50, <0.10	a,b	A
Thallium, dissolved	7440-28-0	---	<200	a	A
Zinc, dissolved	7440-66-6	2.0	58	a	C.1
PESTICIDES/PCBS					
Aldrin ^C	309-00-2	0.05	<0.529, <0.05	a,b	A
Chlordane ^C	57-74-9	0.2	<0.529, <0.2	a,b	A
Chlorpyrifos	2921-88-2	---	<10.4	a	A
DDD ^C	72-54-8	0.1	<0.529, <0.05	a,b	A
DDE ^C	72-55-9	0.1	<0.529, <0.05	a,b	A
DDT ^C	50-29-3	0.1	<0.529, <0.05	a,b	A
Demeton	8065-48-3	---	<10.4	a	A
Diazinon	333-41-5	---	<10.4	a	A
2,4-Dichlorophenoxy acetic acid (synonym = 2,4-D)	94-75-7	---	Applicable to PWS waters only	---	---
Dieldrin ^C	60-57-1	0.1	<0.529, <0.05	a,b	A
Alpha-Endosulfan	959-98-8	0.1	<0.529, <0.05	a,b	A
Beta-Endosulfan	33213-65-9	0.1	<0.529, <0.05	a,b	A
Alpha-Endosulfan + Beta-Endosulfan		---	<1.058	a	A
Endosulfan Sulfate	1031-07-8	0.1	<0.529	a	B.1
Endrin	72-20-8	0.1	<0.529, <0.05	a,b	A
Endrin Aldehyde	7421-93-4	---	<0.529	a	A
Guthion	86-50-0	---	<10.4	a	A
Heptachlor ^C	76-44-8	0.05	<0.529, <0.05	a,b	A
Heptachlor Epoxide ^C	1024-57-3	---	<0.529	a	A
Hexachlorocyclohexane Alpha-BHC ^C	319-84-6	---	<0.529	a	A
Hexachlorocyclohexane Beta-BHC ^C	319-85-7	---	<0.529	a	A
Hexachlorocyclohexane Gamma-BHC (synonym = Lindane)	58-89-9	---	<0.529	a	A

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Parameter	CASRN	QL (ug/L)	Data (ug/L unless noted otherwise)	Source of Data	Data Eval
Kepone	143-50-0	---	<10.4	a	A
Malathion	121-75-5	---	<10.4	a	A
Methoxychlor	72-43-5	---	<0.529	a	A
Mirex	2385-85-5	---	<10.4	a	A
Parathion	56-38-2	---	<10.4	a	A
PCB Total ^C	1336-36-3	7.0	<3.174	a	A
Toxaphene ^C	8001-35-2	5.0	<5.29	a	A**
2-(2,4,5-Trichlorophenoxy) propionic acid (synonym = Silvex)	93-72-1	---	Applicable to PWS waters only	---	---
Tributyltin	60-10-5	---	<40	a	A
BASE NEUTRAL EXTRACTABLES					
Acenaphthene	83-32-9	10.0	<10.4, <10.4, <10.6	a	B.1
Anthracene	120-12-7	10.0	<10.4, <10.4, <10.6	a	B.1
Benzidine ^C	92-87-5	---	<10.4, <10.4, <10.6	a	A
Benzo (a) anthracene ^C	56-55-3	10.0	<10.4, <10.4, <10.6	a	A*
Benzo (b) fluoranthene ^C	205-99-2	10.0	<10.4, <10.4, <10.6	a	A*
Benzo (k) fluoranthene ^C	207-08-9	10.0	<10.4, <10.4, <10.6	a	A*
Benzo (a) pyrene ^C	50-32-8	10.0	<10.4, <10.4, <10.6	a	A*
Bis 2-Chloroethyl Ether ^C	111-44-4	---	<10.4, <10.4, <10.6	a	A
Bis 2-Chloroisopropyl Ether	108-60-1	---	<10.4, <10.4, <10.6	a	A
Bis-2-Ethylhexyl Phthalate ^C	117-81-7	10.0	<10.4, <10.4, <10.6	a	B.1
Butyl benzyl phthalate	85-68-7	10.0	<10.4, <10.4, <10.6	a	B.1
2-Chloronaphthalene	91-58-7	---	<10.4, <10.4, <10.6	a	A
Chrysene ^C	218-01-9	10.0	<10.4, <10.4, <10.6	a	A*
Dibenz(a,h)anthracene ^C	53-70-3	20.0	<10.4, <10.4, <10.6	a	A*
1,2-Dichlorobenzene	95-50-1	10.0	<10.4, <10.4, <10.6	a	B.1
1,3-Dichlorobenzene	541-73-1	10.0	<10.4, <10.4, <10.6	a	B.1
1,4-Dichlorobenzene	106-46-7	10.0	<10.4, <10.4, <10.6	a	B.1
3,3-Dichlorobenzidine ^C	91-94-1	---	<10.4, <10.4, <10.6	a	A
Diethyl phthalate	84-66-2	10.0	<10.4, <10.4, <10.6	a	B.1
Dimethyl phthalate	131-11-3	---	<10.4, <10.4, <10.6	a	A
Di-n-Butyl Phthalate	84-74-2	10.0	<10.4, <10.4, <10.6	a	B.1
2,4-Dinitrotoluene	121-14-2	10.0	<10.4, <10.4, <10.6	a	B.1
1,2-Diphenylhydrazine ^C	122-66-7	---	<10.4, <10.4, <10.6	a	A
Fluoranthene	206-44-0	10.0	<10.4, <10.4, <10.6	a	B.1
Fluorene	86-73-7	10.0	<10.4, <10.4, <10.6	a	B.1
Hexachlorobenzene ^C	118-74-1	---	<10.4, <10.4, <10.6	a	A
Hexachlorobutadiene ^C	87-68-3	---	<10.4, <10.4, <10.6	a	A
Hexachlorocyclopentadiene	77-47-4	---	<10.4, <10.4, <10.6	a	A
Hexachloroethane ^C	67-72-1	---	<10.4, <10.4, <10.6	a	A
Indeno(1,2,3-cd)pyrene ^C	193-39-5	20.0	<10.4, <10.4, <10.6	a	A
Isophorone ^C	78-59-1	10.0	<10.4, <10.4, <10.6	a	B.1
Nitrobenzene	98-95-3	10.0	<10.4, <10.4, <10.6	a	B.1
N-Nitrosodimethylamine ^C	62-75-9	---	<10.4, <10.4, <10.6	a	A
N-Nitrosodi-n-propylamine ^C	621-64-7	---	<10.4, <10.4, <10.6	a	A

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Parameter	CASRN	QL (ug/L)	Data (ug/L unless noted otherwise)	Source of Data	Data Eval
N-Nitrosodiphenylamine ^C	86-30-6	---	<10.4, <10.4, <10.6	a	A
Pyrene	129-00-0	10.0	<10.4, <10.4, <10.6	a	B.1
1,2,4-Trichlorobenzene	120-82-1	10.0	<10.4, <10.4, <10.6	a	B.1
VOLATILES					
Acrolein	107-02-8	---	<50, <50, <50	a	A
Acrylonitrile ^C	107-13-1	---	<50, <50, <50	a	A
Benzene ^C	71-43-2	10.0	<25, <25, <25	a	B.1
Bromoform ^C	75-25-2	10.0	<25, <25, <25	a	B.1
Carbon Tetrachloride ^C	56-23-5	10.0	<25, <25, <25	a	B.1
Chlorobenzene	108-90-7	50.0	<25, <25, <25	a	B.1
Chlorodibromomethane ^C	124-48-1	10.0	<25, <25, <25	a	B.1
Chloroform	67-66-3	10.0	<25, <25, <25	a	B.1
Dichlorobromomethane ^C	75-27-4	10.0	<25, <25, <25	a	B.1
1,2-Dichloroethane ^C	107-06-2	10.0	<25, <25, <25	a	B.1
1,1-Dichloroethylene	75-35-4	10.0	<25, <25, <25	a	B.1
1,2-trans-dichloroethylene	156-60-5	---	<25, <25, <25	a	A
1,2-Dichloropropane ^C	78-87-5	---	<25, <25, <25	a	A
1,3-Dichloropropene ^C	542-75-6	---	<25, <25, <25	a	A
Ethylbenzene	100-41-4	10.0	<25, <25, <25	a	B.1
Methyl Bromide	74-83-9	---	<25, <25, <25	a	A
Methylene Chloride ^C	75-09-2	20.0	<25, <25, <25	a	B.1
1,1,2,2-Tetrachloroethane ^C	79-34-5	---	<25, <25, <25	a	A
Tetrachloroethylene	127-18-4	10.0	<25, <25, <25	a	B.1
Toluene	10-88-3	10.0	<25, <25, <25	a	B.1
1,1,2-Trichloroethane ^C	79-00-5	---	<25, <25, <25	a	A
Trichloroethylene ^C	79-01-6	10.0	<25, <25, <25	a	B.1
Vinyl Chloride ^C	75-01-4	10.0	<25, <25, <25	a	B.1
RADIONUCLIDES					
Beta Particle & Photon Activity (mrem/yr)	N/A	---	Applicable to PWS waters only	---	---
Combined Radium 226 and 228 (pCi/L)	N/A	---	Applicable to PWS waters only	---	---
Gross Alpha Particle Activity (pCi/L)	N/A	---	Applicable to PWS waters only	---	---
Uranium	N/A	---	Applicable to PWS waters only	---	---
ACID EXTRACTABLES					
2-Chlorophenol	95-57-8	10.0	<10.4, <10.4, <10.6	a	B.1
2,4-Dichlorophenol	120-83-2	10.0	<10.4, <10.4, <10.6	a	B.1
2,4-Dimethylphenol	105-67-9	10.0	<10.4, <10.4, <10.6	a	B.1
2,4-Dinitrophenol	51-28-5	---	<10.4, <10.4, <10.6	a	A
2-Methyl-4,6-Dinitrophenol	534-52-1	---	<10.4, <10.4, <10.6	a	A
Nonylphenol	104-40-51	---	<10.4, <10.4, <10.6	a	A
Pentachlorophenol ^C	87-86-5	50.0	<10.4, <10.4, <10.6	a	A
Phenol	108-95-2	10.0	<10.4, <10.4, <10.6	a	B.1
2,4,6-Trichlorophenol ^C	88-06-2	10.0	<10.4, <10.4, <10.6	a	B.1

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Parameter	CASRN	QL (ug/L)	Data (ug/L unless noted otherwise)	Source of Data	Data Eval
MISCELLANEOUS					
Ammonia-N (mg/L) (Jun-Dec)	766-41-7	0.2 mg/L	Default = 9 mg/L	c	C.2
Ammonia-N (mg/L) (Jan-May)	766-41-7	0.2 mg/L	Default = 9 mg/L	c	C.2
Chloride (mg/L)	16887-00-6	---	191	a	C.1
TRC (mg/L)	7782-50-5	0.1 mg/L	Default = 20 mg/L	c	C.2
Cyanide, Free	57-12-5	10.0	<20, <10	a,b	A
Dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin)	1746-01-6	0.01	Applicable to Paper Mills & Oil Refineries only	---	---
Foaming Agents (as MBAS)	N/A	---	Applicable to PWS waters only	---	---
Hydrogen Sulfide	7783-06-4	---	<1000	a	A
Nitrate as N (mg/L)	14797-55-8	---	Applicable to PWS waters only	---	---
Sulfate (mg/L)	N/A	---	Applicable to PWS waters only	---	---
Total Dissolved Solids (mg/L)	N/A	---	Applicable to PWS waters only	---	---
Hardness (mg/L as CaCO ₃)	471-34-1	---	142, 188, 205	d	N/A

TOXLARGE – 28 MGD Flow Tier

Parameter	CASRN	QL (ug/L)	Data (ug/L unless noted otherwise)	Source of Data	Data Eval
Ammonia-N (mg/L) (Jun-Dec)	766-41-7	0.2 mg/L	Default = 9 mg/L	c	C.2
Ammonia-N (mg/L) (Jan-May)	766-41-7	0.2 mg/L	Default = 9 mg/L	c	C.2
TRC (mg/L)	7782-50-5	0.1 mg/L	Default = 20 mg/L	c	C.2
Monitoring for all other applicable parameters is required within 1 year of the issuance of the CTO for the 28 MGD facility.					

"Type" column indicates a category assigned to the referenced substance (see below):

A = Acid Extractable Organic Compounds
 B = Base/Neutral Extractable Organic Compounds
 M = Metals
 p = PCBs
 P = Pesticides
 R = Radionuclides
 V = Volatile Organic Compounds
 X = Miscellaneous Compounds and Parameters

The **superscript "C"** following the parameter name indicates that the substance is a known or suspected carcinogen; human health criteria at risk level 10⁻⁵.

"Source of Data" codes:

a = permittee monitoring performed in January 2011
 b = permittee monitoring performed in May 2011
 c = default effluent concentration
 d = permittee monitoring performed in February 2011

"Data Evaluation" codes:

See section titled PROTOCOL FOR THE EVALUATION OF EFFLUENT TOXIC POLLUTANTS for an explanation of the code used.

CASRN = Chemical Abstract Service Registry Number for each parameter is referenced in the current Water Quality Standards. A unique numeric identifier designating only one substance. The Chemical Abstract Service is a division of the American Chemical Society.

Fact Sheet – VPDES Permit No. VA0060640 – North River WWTF

STAT.EXE RESULTS – 22 MGD Flow Tier:

<p><u>Ammonia-N (Jun-Dec)</u> Chronic averaging period = 30 WLAa = 23 WLAc = 3.3 Q.L. = 0.2 # samples/mo. = 30 # samples/wk. = 7</p> <p>Summary of Statistics: # observations = 1 Expected Value = 9 Variance = 29.16 C.V. = 0.6 97th percentile daily values = 21.9007 97th percentile 4 day average = 14.9741 97th percentile 30 day average = 10.8544 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data</p> <p>A limit is needed based on Chronic Toxicity Maximum Daily Limit = 6.65831130827382 Average Weekly Limit = 4.06627870076135 Average Monthly Limit = 3.3</p> <p>The data are: 9</p>	<p><u>Ammonia-N (Jan-May)</u> Chronic averaging period = 30 WLAa = 25 WLAc = 6.4 Q.L. = 0.2 # samples/mo. = 30 # samples/wk. = 7</p> <p>Summary of Statistics: # observations = 1 Expected Value = 9 Variance = 29.16 C.V. = 0.6 97th percentile daily values = 21.9007 97th percentile 4 day average = 14.9741 97th percentile 30 day average = 10.8544 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data</p> <p>A limit is needed based on Chronic Toxicity Maximum Daily Limit = 12.9130885978644 Average Weekly Limit = 7.88611626814323 Average Monthly Limit = 6.4</p> <p>The data are: 9</p>	<p><u>TRC</u> Chronic averaging period = 4 WLAa = 0.026 WLAc = 0.018 Q.L. = 0.1 # samples/mo. = 360 # samples/wk. = 90</p> <p>Summary of Statistics: # observations = 1 Expected Value = 20 Variance = 144 C.V. = 0.6 97th percentile daily values = 48.6683 97th percentile 4 day average = 33.2758 97th percentile 30 day average = 24.1210 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data</p> <p>A limit is needed based on Acute Toxicity Maximum Daily Limit = 0.026 Average Weekly Limit = 1.20089240803129E-02 Average Monthly Limit = 0.011320105663958</p> <p>The data are: 20</p>
<p><u>Arsenic, Dissolved</u> Chronic averaging period = 4 WLAa = 470 WLAc = 240 Q.L. = 1.0 # samples/mo. = 1 # samples/wk. = 1</p> <p>Summary of Statistics: # observations = 1 Expected Value = 20 Variance = 144 C.V. = 0.6 97th percentile daily values = 48.6683 97th percentile 4 day average = 33.2758 97th percentile 30 day average = 24.1210 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data</p> <p>No Limit is required for this material</p> <p>The data are: 20</p>	<p><u>Chloride</u> Chronic averaging period = 4 WLAa = 1200 WLAc = 370 Q.L. = 1 # samples/mo. = 1 # samples/wk. = 1</p> <p>Summary of Statistics: # observations = 1 Expected Value = 191 Variance = 13133.1 C.V. = 0.6 97th percentile daily values = 464.782 97th percentile 4 day average = 317.783 97th percentile 30 day average = 230.356 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data</p> <p>No Limit is required for this material</p> <p>The data are: 191</p>	<p><u>Chromium III, Dissolved</u> Chronic averaging period = 4 WLAa = 1200 WLAc = 180 Q.L. = 0.5 # samples/mo. = 1 # samples/wk. = 1</p> <p>Summary of Statistics: # observations = 1 Expected Value = 5 Variance = 9 C.V. = 0.6 97th percentile daily values = 12.1670 97th percentile 4 day average = 8.31895 97th percentile 30 day average = 6.03026 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data</p> <p>No Limit is required for this material</p> <p>The data are: 5</p>
<p><u>Chromium VI, Dissolved</u> Chronic averaging period = 4 WLAa = 22 WLAc = 18 Q.L. = 0.5 # samples/mo. = 1 # samples/wk. = 1</p> <p>Summary of Statistics: # observations = 1 Expected Value = 5 Variance = 9 C.V. = 0.6 97th percentile daily values = 12.1670 97th percentile 4 day average = 8.31895 97th percentile 30 day average = 6.03026 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data</p> <p>No Limit is required for this material</p> <p>The data are: 5</p>	<p><u>Copper, Dissolved</u> Chronic averaging period = 4 WLAa = 30 WLAc = 22 Q.L. = 0.5 # samples/mo. = 1 # samples/wk. = 1</p> <p>Summary of Statistics: # observations = 1 Expected Value = 1 Variance = .36 C.V. = 0.6 97th percentile daily values = 2.43341 97th percentile 4 day average = 1.66379 97th percentile 30 day average = 1.20605 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data</p> <p>No Limit is required for this material</p> <p>The data are: 1</p>	<p><u>Lead, Dissolved</u> Chronic averaging period = 4 WLAa = 310 WLAc = 40 Q.L. = 0.5 # samples/mo. = 1 # samples/wk. = 1</p> <p>Summary of Statistics: # observations = 1 Expected Value = 1 Variance = .36 C.V. = 0.6 97th percentile daily values = 2.43341 97th percentile 4 day average = 1.66379 97th percentile 30 day average = 1.20605 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data</p> <p>No Limit is required for this material</p> <p>The data are: 1</p>

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STAT.EXE RESULTS – 22 MGD Flow Tier:

<p><u>Nickel, Dissolved</u> Chronic averaging period = 4 WLAa = 390 WLAc = 49 Q.L. = 0.5 # samples/mo. = 1 # samples/wk. = 1</p> <p>Summary of Statistics: # observations = 1 Expected Value = 2 Variance = 1.44 C.V. = 0.6 97th percentile daily values = 4.86683 97th percentile 4 day average = 3.32758 97th percentile 30 day average = 2.41210 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data</p> <p>No Limit is required for this material</p> <p>The data are: 2</p>	<p><u>Zinc, Dissolved</u> Chronic averaging period = 4 WLAa = 250 WLAc = 280 Q.L. = 2 # samples/mo. = 1 # samples/wk. = 1</p> <p>Summary of Statistics: # observations = 1 Expected Value = 58 Variance = 1211.04 C.V. = 0.6 97th percentile daily values = 141.138 97th percentile 4 day average = 96.4998 97th percentile 30 day average = 69.9510 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data</p> <p>No Limit is required for this material</p> <p>The data are: 58</p>	
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STAT.EXE RESULTS – 28 MGD Flow Tier:

<p><u>Ammonia-N (Jun-Dec)</u> Chronic averaging period = 30 WLAa = 22 WLAc = 3.1 Q.L. = 0.2 # samples/mo. = 30 # samples/wk. = 7</p> <p>Summary of Statistics: # observations = 1 Expected Value = 9 Variance = 29.16 C.V. = 0.6 97th percentile daily values = 21.9007 97th percentile 4 day average = 14.9741 97th percentile 30 day average = 10.8544 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data</p> <p>A limit is needed based on Chronic Toxicity Maximum Daily Limit = 6.25477728959056 Average Weekly Limit = 3.81983756738187 Average Monthly Limit = 3.1</p> <p>The data are: 9</p>	<p><u>Ammonia-N (Jan-May)</u> Chronic averaging period = 30 WLAa = 24 WLAc = 5.8 Q.L. = 0.2 # samples/mo. = 30 # samples/wk. = 7</p> <p>Summary of Statistics: # observations = 1 Expected Value = 9 Variance = 29.16 C.V. = 0.6 97th percentile daily values = 21.9007 97th percentile 4 day average = 14.9741 97th percentile 30 day average = 10.8544 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data</p> <p>A limit is needed based on Chronic Toxicity Maximum Daily Limit = 11.7024865418146 Average Weekly Limit = 7.1467928680048 Average Monthly Limit = 5.8</p> <p>The data are: 9</p>	<p><u>TRC</u> Chronic averaging period = 4 WLAa = 0.026 WLAc = 0.016 Q.L. = 0.1 # samples/mo. = 360 # samples/wk. = 90</p> <p>Summary of Statistics: # observations = 1 Expected Value = 20 Variance = 144 C.V. = 0.6 97th percentile daily values = 48.6683 97th percentile 4 day average = 33.2758 97th percentile 30 day average = 24.1210 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data</p> <p>A limit is needed based on Chronic Toxicity Maximum Daily Limit = 2.34011965448517E-02 Average Weekly Limit = 1.08085843344463E-02 Average Monthly Limit = 0.010188616059645</p> <p>The data are: 20</p>
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WHOLE EFFLUENT TOXICITY (WET) EVALUATION:

Applicability of TMP: Based upon current TMP guidance (GM No. 00-2012, 8/24/00), this discharge qualifies as being subject to TMP requirements because:

- It is a Publicly Owned Treatment Works (POTW).
- It is a Major Municipal facility.
- The design flow is = 1.0 MGD.
- It has an approved Pretreatment Program.

Design Flow: The 2006 permit included requirements for design flow tiers of 16 MGD, 22 MGD, and 28 MGD. A CTO for the 22 MGD facility was issued on December 8, 2010; therefore, the 16 MGD design flow tier is no longer applicable. The permit application dated February 14, 2011 requested that permit requirements be based on design flow tiers of 22 MGD and 28 MGD.

Summary of Toxicity Testing: Table 1 contains the results of the 1st – 3rd annual chronic toxicity tests using *Ceriodaphnia dubia* which were required at the design flow of 16 MGD. Because the CTO has been issued for the 22 MGD facility, requirements for the 16 MGD facility have not been included in the reissued permit and an evaluation of the data was not performed. Tables 2 and 3 contain the results of the 1st annual acute and chronic toxicity testing required by the previous permit using *Ceriodaphnia dubia* and *Pimephales promelas* for the 22 MGD facility.

Rationale for Acute versus Chronic Toxicity Testing: The previous fact sheet contained a discussion that the results of the acute and chronic testing during the permit term provided a basis for assuming that there is no reasonable potential for acute toxicity to be present at Outfall 001 at the 16 MGD design flow; therefore, the previous permit only contained chronic toxicity testing for the 16 MGD design flow tier. Because the 16 MGD facility has been replaced with a 22 MGD facility, the permittee must conduct both acute and chronic toxicity testing.

Rationale for Most Sensitive Species: The previous fact sheet provided a rationale that the most sensitive species was *Ceriodaphnia dubia*. As a result, chronic toxicity testing for the 16 MGD facility included only 1 species. Because the 16 MGD facility has been replaced with a 22 MGD facility, the permittee must conduct acute and chronic toxicity testing using two species.

Rationale for Quarterly Monitoring Versus Annual Monitoring: Because the CTO was issued in December 2010, the first quarterly acute and chronic toxicity monitoring has been completed. The 2011 permit will begin with the second quarterly toxicity testing. The monitoring shall continue until a total of four quarters are completed. Per the TMP Guidance, both species (*Ceriodaphnia dubia* and *Pimephales promelas*) have been required for both acute and chronic testing. The results from all the quarterly testing will be evaluated to determine if there is a need for any WET limits. If no limits are deemed necessary and all tests are acceptable, the facility will move to annual monitoring at a time period specified by DEQ.

Testing Period: The testing period of July 1st to August 31st for conducting the annual toxicity testing was established in the previous permit. According to TMP guidance, when a facility begins toxicity testing under a new design flow tier, the toxicity testing is done quarterly to provide data over the course of a seasonal year. After the four quarters of testing, the Department may define the months in which the annual testing is required based on the results of the quarterly monitoring. Toxicity testing for the 22 MGD facility was conducted on August 24, 2010. This test will be acceptable as counting as the first quarterly testing for the 22 MGD facility.

Sample Type: 24-hour composite samples are considered representative of discharge quality.

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Evaluation of Acute Instream Waste Concentration (IWC_a):

Design Flow of 22 MGD: The IWC_a for Outfall 001 is 71.92% (See Table 4). Because the IWC_a is greater than 33%, specify the NOAEC = 100% test/endpoint for use.

Design Flow of 28 MGD: The IWC_a for Outfall 001 is 73.59% (See Table 5). Because the IWC_a is greater than 33%, specify the NOAEC = 100% test/endpoint for use.

Evaluation of WLAs: The July 11, 2011 Flow Frequency Determination indicates the 7Q10 and 1Q10 of the receiving stream. The following acute and chronic WLAs were generated from the Department's WETlim10.xls spreadsheet by entering the design flow, stream flows, and stream mix percentages for the respective stream flows (See Tables 4 and 5):

Design Flow	Acute WLA _a	Acute WLA _{a,c}	Chronic WLA _c
22 MGD	0.4171145	4.1711455	1.6045455
28 MGD	0.4076574	4.0765736	1.475

Notes: WLA_a = Acute WLA

WLA_{a,c} = Acute WLA expressed as chronic (WLA_a X 10)

WLA_c = Chronic WLA

The WLAs are used in the Department's Stat.exe program in order to perform a statistical evaluation of the chronic test results expressed as Toxicity Units (TUs). As indicated in Tables 4 and 5, if the mean of the data exceeds a TU_a or TU_c = 1.0, a limit may result using the Department's Stat.exe program

Acute and Chronic Dilution Series: The recommended dilution series for both the acute and chronic tests is a 0.5 series starting at 100%.

Peer Reviewer: Dawn Jeffries (04/05/11)

Table 1
Summary of Chronic Toxicity Testing for *Ceriodaphnia dubia*
North River WWTF – 16 MGD Facility

Monitoring Period	Test Period	Chronic 3-Brood Static Renewal Survival and Reproduction <i>Ceriodaphnia dubia</i>		48-hr LC ₅₀	% Survival in 100% Effluent
		Survival (TU _c)	Reproduction (TU _c)		
1 st Annual	8/07/07 – 8/13/07	1.0	1.0	>100	90
2 nd Annual	8/19/08 – 8/25/08	1.0	1.0	>100	90
3 rd Annual	8/25/09 – 8/31/09	1.0	1.0	>100	100

Table 2
Summary of Chronic Toxicity Testing
North River WWTF – 22 MGD Facility

Monitoring Period	Test Date	Chronic 3-Brood Static Renewal Survival and Reproduction <i>Ceriodaphnia dubia</i>		Chronic 7-Day Static Renewal Survival and Growth <i>Pimephales promelas</i>	
		Survival (TU _c)	Reproduction (TU _c)	Survival (TU _c)	Growth (TU _c)
1 st Annual/Quarter	8/24/10	1.0	1.0	1.0	1.0

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Table 3
Summary of Acute Toxicity Testing
North River WWTF – 22 MGD Facility

Monitoring Period	Test Date	48-Hr. Static Acute <i>Ceriodaphnia dubia</i> (TU _a)	48-Hr Static Acute <i>Pimephales promelas</i> (TU _a)
1 st Annual/Quarter	8/24/10	1.0	1.0

Table 4

Spreadsheet for determination of WET test endpoints or WET limits									
Excel 97 Revision Date: 01/10/05 File: WETLIM10.xls (MIX.EXE required also)		Acute Endpoint/Permit Limit		Use as LC ₅₀ in Special Condition, as T _{Ua} on DMR					
ACUTE	100% =	NOAEC	LC ₅₀ =	NA	% Use as	NA	T _{Ua}		
ACUTE WLA _a	0.4171145	Note: Inform the permittee that if the mean of the data exceeds this T _{Ua} : 1.0 a limit may result using WLA.EXE							
Chronic Endpoint/Permit Limit		Use as NOEC in Special Condition, as T _{Uc} on DMR							
CHRONIC	2.34676756 T _{Uc}	NOEC =	43	% Use as	2.32	T _{Uc}			
BOTH*	4.17114556 T _{Uc}	NOEC =	24	% Use as	4.16	T _{Uc}			
AML	2.34676756 T _{Uc}	NOEC =	43	% Use as	2.32	T _{Uc}			
ACUTE WLA _{a,c}	4.1711455	Note: Inform the permittee that if the mean of the data exceeds this T _{Uc} : 1.0							
CHRONIC WLA _c	1.6045455	a limit may result using WLA.EXE							
* Both means acute expressed as chronic									
Enter data in the cells with blue type:		% Flow to be used from MIX.EXE		Diffuser /modeling study?					
Plant Flow:	22 MGD	84.2 %		Enter Y/N					
Acute 1Q10:	10.2 MGD	100 %		Acute N					
Chronic 7Q10:	13.3 MGD			Chronic 1 -1					
Are data available to calculate CV? (Y/N)		N		(Minimum of 10 data points, same species, needed)					
Are data available to calculate ACR? (Y/N)		N		(NOEC<LC50, do not use greater/less than data)					
				Go to Page 2					
				Go to Page 3					
IWC _a	71.92268965 %	Plant flow/plant flow + 1Q10	NOTE: If the IWC _a is >33%, specify the						
IWC _c	62.32294618 %	Plant flow/plant flow + 7Q10	NOAEC = 100% test/endpoint for use						
Dilution, acute	1.390381818	100/IWC _a							
Dilution, chronic	1.604545455	100/IWC _c							
WLA _a	0.417114545	Instream criterion (0.3 T _{Ua}) X's Dilution, acute							
WLA _c	1.604545455	Instream criterion (1.0 T _{Uc}) X's Dilution, chronic							
WLA _{a,c}	4.171145455	ACR X's WLA _a - converts acute WLA to chronic units							
ACR -acute/chronic ratio	10	LC50/NOEC (Default is 10 - if data are available, use tables Page 3)							
CV-Coefficient of variation	0.6	Default of 0.6 - if data are available, use tables Page 2)							
Constants	eA 0.4109447	Default = 0.41							
	eB 0.6010373	Default = 0.60							
	eC 2.4334175	Default = 2.43							
	eD 2.4334175	Default = 2.43 (1 samp							
		No. of sample	1	**The Maximum Daily Limit is calculated from the lowest					
LTA _{a,c}	1.714110117	WLA _{a,c} X's eA	LTA, X's eC. The LTA _{a,c} and MDL using it are driven by the ACR.						
LTA _c	0.964391668	WLA _c X's eB							
MDL** with LTA _{a,c}	4.171145557 T _{Uc}	NOEC =	23.974229	(Protects from acute/chronic toxicity)				Rounded NOEC's	%
MDL** with LTA _c	2.346767561 T _{Uc}	NOEC =	42.611804	(Protects from chronic toxicity)				NOEC =	24 %
MDL with lowest LTA	2.346767561 T _{Uc}	NOEC =	42.611804	Lowest LTA X's eD				NOEC =	43 %
IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM T _{Uc} to T _{Ua}									
MDL with LTA _{a,c}	0.417114556 T _{Ua}	LC50 =	239.742293%	Use NOAEC=100%				Rounded LC50's	%
MDL with LTA _c	0.234676756 T _{Ua}	LC50 =	426.118043%	Use NOAEC=100%				LC50 =	NA %
ADJUSTED DILUTION SERIES TO RECOMMEND									
22 MGD Flow Tier		Monitoring		Limit					
		% Effluent	T _{Uc}	% Effluent		T _{Uc}			
Dilution series based on data mean		100	1.000000	43		2.33			
Dilution series to use for limit				0.655743852					
Dilution factor to recommend:		0.5							
Dilution series to recommend:		100.0	1.00	100.0		1.00			
		50.0	2.00	65.6		1.52			
		25.0	4.00	43.0		2.33			
		12.5	8.00	28.2		3.55			
		6.3	16.00	18.5		5.41			
Extra dilutions if needed		3.12	32.05	12.12		8.25			
		1.56	64.10	7.95		12.58			

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Table 5

Spreadsheet for determination of WET test endpoints or WET limits									
Excel 97		Acute Endpoint/Permit Limit		Use as LC ₅₀ in Special Condition, as TU _a on DMR					
Revision Date: 01/10/05		ACUTE 100% = NOAEC		LC ₅₀ = NA % Use as NA TU _a					
File: WETLIM10.xls		ACUTE WLA _a 0.4076574		Note: Inform the permittee that if the mean of the data exceeds this TU _a : 1.0 a limit may result using WLA.EXE					
(MIX.EXE required also)		Chronic Endpoint/Permit Limit		Use as NOEC in Special Condition, as TU _c on DMR					
		CHRONIC 2.15729766 TU _c		NOEC = 47 % Use as 2.12 TU _c					
		BOTH* 4.07657367 TU _c		NOEC = 25 % Use as 4.00 TU _c					
		AML 2.15729766 TU _c		NOEC = 47 % Use as 2.12 TU _c					
Enter data in the cells with blue type:		ACUTE WLA _{a,c} 4.0765736		Note: Inform the permittee that if the mean of the data exceeds this TU _c : 1.0 a limit may result using WLA.EXE					
		CHRONIC WLA _c 1.475		*Both means acute expressed as chronic					
		% Flow to be used from MIX.EXE		Difuser /modeling study?					
Entry Date: 04/05/11				Enter Y/N					
Facility Name: North River WWTF				Acute N					
VPDES Number: VA0060640				Chronic 1					
Outfall Number: 001				Chronic 1					
Plant Flow: 28 MGD									
Acute 1Q10: 10.2 MGD		98.51 %							
Chronic 7Q10: 13.3 MGD		100 %							
Are data available to calculate CV? (Y/N)		N		(Minimum of 10 data points, same species, needed)					
Are data available to calculate ACR? (Y/N)		N		(NOEC<LC50, do not use greater/less than data)					
				Go to Page 2					
				Go to Page 3					
IWC _a 73.59121447 %		Plant flow/plant flow + 1Q10		NOTE: If the IWC _a is >33%, specify the NOAEC = 100% test/endpoint for use					
IWC _c 67.79661017 %		Plant flow/plant flow + 7Q10							
Dilution, acute 1.358857857		100/IWC _a							
Dilution, chronic 1.475		100/IWC _c							
WLA _a 0.407657357		Instream criterion (0.3 TU _a) X's Dilution, acute							
WLA _c 1.475		Instream criterion (1.0 TU _c) X's Dilution, chronic							
WLA _{a,c} 4.076573571		ACR X's WLA _a - converts acute WLA to chronic units							
ACR -acute/chronic ratio 10		LC50/NOEC (Default is 10 - if data are available, use tables Page 3)							
CV-Coefficient of variation 0.6		Default of 0.6 - if data are available, use tables Page 2)							
Constants eA 0.4109447		Default = 0.41							
eB 0.6010373		Default = 0.60							
eC 2.4334175		Default = 2.43							
eD 2.4334175		Default = 2.43 (1 samp)		No. of sample 1					
				**The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The LTA _{a,c} and MDL using it are driven by the ACR.					
LTA _{a,c} 1.675246303		WLA _{a,c} X's eA		Rounded NOEC's %					
LTA _c 0.886530018		WLA _c X's eB							
MDL** with LTA _{a,c} 4.076573671		TU _c NOEC = 24.530404		(Protects from acute/chronic toxicity) NOEC = 25 %					
MDL** with LTA _c 2.157297659		TU _c NOEC = 46.354289		(Protects from chronic toxicity) NOEC = 47 %					
AML with lowest LTA 2.157297659		TU _c NOEC = 46.354289		Lowest LTA X's eD NOEC = 47 %					
IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TU _a to TU _c									
MDL with LTA _{a,c} 0.407657367		TU _c LC50 = 245.304042 %		Use NOAEC=100% LC50 = NA %					
MDL with LTA _c 0.215729766		TU _c LC50 = 463.542894 %		Use NOAEC=100% LC50 = NA %					
ADJUSTED DILUTION SERIES TO RECOMMEND									
28 MGD Flow Tier		Monitoring		Limit					
		% Effluent		TU _c		% Effluent		TU _c	
Dilution series based on data mean		100		1.000000		47		2.13	
Dilution series to use for limit						0.68556546			
Dilution factor to recommend:		0.5							
Dilution series to recommend:		100.0		1.00		100.0		1.00	
		50.0		2.00		68.6		1.46	
		25.0		4.00		47.0		2.13	
		12.5		8.00		32.2		3.10	
		6.3		16.00		22.1		4.53	
Extra dilutions if needed		3.12		32.05		15.14		6.60	
		1.56		64.10		10.38		9.63	

APPENDIX C

BASES FOR PERMIT SPECIAL CONDITIONS

Tabulated below are the sections of the permit, with any changes and the reasons for the changes identified. Also provided is the basis for each of the permit special conditions.

- Cover Page • Content and format as prescribed by the VPDES Permit Manual.
- Part I.A.1. **Effluent Limitations and Monitoring Requirements:**
Updates Part I.A.3. of the previous permit with the following:
- Changes were made to the format and introductory language.
 - A more stringent CBOD₅ (Jun-Dec) monthly average loading limit was included.
 - More stringent CBOD₅ (Jan-May) concentration and loading limits were included.
 - Concentration limits for TKN (Jun-Dec) and TKN (Jan-May) were included.
 - Less stringent TKN (Jun-Dec) and TKN (Jan-May) loading limits were included.
 - More stringent Ammonia-N limits were included.
 - More stringent TRC limits were included.
 - E. coli monitoring and a limit were included in addition to the TRC monitoring.
 - Nitrate+Nitrite, TN, Orthophosphate, and TP monitoring, along with the TN and TP Calendar Year load limits, were removed since they are reported under the permittee's VPDES GP coverage (VAN010042).
 - Footnotes were updated to reflect current DEQ guidance and changes in the reissued permit.
- Part I.A.2. **Effluent Limitations and Monitoring Requirements:**
Updates Part I.A.5. of the previous permit with the following:
- Changes were made to the format and introductory language
 - A less stringent maximum weekly average CBOD₅ (Jan-May) loading limit was included.
 - TKN concentration limits and maximum weekly average loading limits were included.
 - More stringent Ammonia-N limits were included.
 - More stringent TRC limits were included.
 - E. coli monitoring was included in addition to the TRC monitoring.
 - Nitrate plus Nitrite, TN, Orthophosphate, and TP monitoring, along with the TN and TP Calendar Year load limits, were removed since they are reported under the permittee's VPDES GP coverage (VAN010042).
 - Footnotes were updated to reflect current DEQ guidance and changes in the reissued permit.
- Part I.B. **Additional TRC And E. coli Limitations and Monitoring Requirements:** *Updates Part I.B. of the previous permit.* The chlorine contact requirements were revised. The E. coli monitoring frequency was changed to 1/Day per DEQ Guidance. Required by Sewage Collection and Treatment (SCAT) Regulations and 9 VAC 25-260-170, Bacteria; other waters. Also, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. This ensures proper operation of chlorination equipment to maintain adequate disinfection.
- Part I.C. **Effluent Limitations and Monitoring Requirements – Additional Instructions:** *Updates Part I.D. of the previous permit.* TKN, TP, Orthophosphate, and Nitrate-Nitrite were deleted. The paragraph regarding significant digits was revised. Authorized by VPDES Permit Regulation, 9 VAC 25-31-190.J.4 and 220.I. This condition is necessary when a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values. Nutrient reporting calculations were updated. §62.1 44.19:13 of the Code of Virginia defines how annual nutrient loads are to be calculated; this is carried forward in 9 VAC 25-820-70. As annual concentrations are limited in the individual permit, this special condition is intended to reconcile the reporting calculations between the permit programs, as the permittee is collecting a single set of samples for the purpose of ascertaining compliance with two permits.

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- Part I.D. **STP Bypasses:** *Updates Part I.E. of the previous permit.* Identifies the bypass outfall and specifies monitoring and reporting requirements of the bypass discharge to verify compliance with the permit effluent limits per the VPDES Permit Regulation.
- Part I.E. **Pretreatment Program Requirements:** *Updates Part I.F. of the previous permit.* VPDES Permit Regulation, 9 VAC 25-31-730 through 900, and 40 CFR part 403 require certain existing and new sources of pollution to meet specified regulations.
- Part I.F. **Whole Effluent Toxicity (WET) Requirements:** *Updates Part I.G. of the previous permit.* VPDES Permit Regulation, 9 VAC 25-31-210 and 220 I, requires monitoring in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act.
- Part I.G.1. **95% Capacity Reopener:** *Identical to Part I.H.1. of the previous permit.* Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 4 for certain permits.
- Part I.G.2. **Indirect Dischargers:** *Identical to Part I.H.2. of the previous permit.* Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 1 for all STPs that receive waste from someone other than the owner of the treatment works.
- Part I.G.3. **Materials Handling/Storage:** *Identical to Part I.H.3. of the previous permit.* 9 VAC 25-31-280.B.2. requires that the types and quantities of “wastes, fluids, or pollutants which are ... treated, stored, etc.” be addressed for all permitted facilities.
- Part I.G.4. **O&M Manual Requirement:** *Updates Part I.H.4. of the previous permit.* Required by Code of Virginia 62.1-44.19, SCAT Regulations 9 VAC 25-790, and VPDES Permit Regulation 9 VAC 25-31-190 E for all STPs. Added requirement to describe procedures for documenting compliance with the permit requirement that there shall be no discharge of floating solids or visible foam in other than trace amounts.
- Part I.G.5. **CTC/CTO Requirement:** *Identical to Part I.H.5. of the previous permit.* Required by Code of Virginia 62.1-44.19, SCAT Regulations 9 VAC 25-790, and VPDES Permit Regulation 9 VAC 25-31-190 E for all STPs.
- Part I.G.6. **SMP Requirement:** *Updates Part I.I.1. and Part I.J.1. of the previous permit.* VPDES Permit Regulation 9 VAC 25-31-100 P, 220 B 2, and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. Technical requirements are derived from the Virginia Pollution Abatement Permit Regulation (9 VAC 25-32-10 *et seq.*)
- Part I.G.7. **Licensed Operator Requirement:** *Identical to Part I.H.6. of the previous permit.* The VPDES Permit Regulation 9 VAC 25-31-200 C, the Code of Virginia 54.1-2300 *et seq.*, and Rules and Regulations for Waterworks and Wastewater Works Operators 18 VAC 160-20-10 *et seq.*, require licensure of operators. A Class I license is indicated for the 22 MGD and 28 MGD facilities.
- Part I.G.8. **Reliability Class:** *Updates Part I.H.7. of the previous permit.* Required by SCAT Regulations 9 VAC 25-790. Class I status was assigned to the 22 MGD facility.
- Part I.G.9. **Water Quality Criteria Monitoring:** *Updates Part I.H.8. of the previous permit.* State Water Control Law at 62.1-44.21 authorizes the Board to request information needed to determine the discharge’s impact on State waters. States are required to review data on discharges to identify actual or potential toxicity problems, or the attainment of water quality goals, according to 40 CFR Part 131, Water Quality Standards, subpart 131.11. To ensure that water quality criteria are maintained, the permittee is required to analyze the facility’s effluent for the substances noted in Attachment A of this VPDES permit.

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- Part I.G.10. **Treatment Works Closure Plan:** *Updates Part I.H.9. of the previous permit.* Required for all STPs per the State Water Control Law at 62.1-44.18.C. and 62.1-44.15:1.1., and the SCAT Regulations at 9 VAC 25-790-450.E.. and 9 VAC 25-790-120.E.3.
- Part I.G.11. **Reopeners:**
- a. *Updates Part I.H.10. of the previous permit:* Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The reopener recognizes that, according to section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act.
 - b. *New Requirement:* 9 VAC 25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade.
 - c. *Updates Part I.H.11. of the previous permit:* 9 VAC 25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.
 - d. *Updates Part I.I.2. of the previous permit:* Required by the VPDES Permit Regulation, 9 VAC 25-31-220.C, for all permits issued to STPs.
- Part I.G.12. **Suspension of concentration limits for E3/E4 facilities:** *Updates Part I.H.15. of the previous permit.* 9 VAC 25-40-70 B authorizes DEQ to approve an alternate compliance method to the technology-based effluent concentration limitations as required by subsection A of this section. Such alternate compliance method shall be incorporated into the permit of an Exemplary Environmental Enterprise (E3) facility or an Extraordinary Environmental Enterprise (E4) facility to allow the suspension of applicable technology-based effluent concentration limitations during the period the E3 or E4 facility has a fully implemented environmental management system that includes operation of installed nutrient removal technologies at the treatment efficiency levels for which they were designed.
- Part II **Conditions Applicable to All VPDES Permits:** *Identical to Part II of previous permit.* VPDES Permit Regulation 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed

DELETIONS

Tabulated below are the sections of the previous permit that were deleted and the basis for this action.

- Part I.A.1. **Effluent Limitations and Monitoring Requirements:** The 16 MGD flow tiers is no longer needed since the facility has received a CTO for the 22 MGD facility.
- Parts I.A.2. & 4. **Effluent Limitations and Monitoring Requirements:** The additional limits pages are no longer needed since the WQMP has been updated to include revised limits.
- Parts I.A.6. & 7. **Sludge and Soil Limitations and Monitoring Requirements:** These requirements are no longer applicable since the facility no longer land applies biosolids under the authorization of this permit.
- Part I.C. **Schedule of Compliance (SOC):** The TP and TN WLA SOC was superseded by the permittee obtaining coverage under the nutrient GP.
- Parts I.H.12. **Basis of Design for Nutrient Removal:** This requirement was superseded by the permittee obtaining coverage under the nutrient GP.
- Part I.H.13. **General Permit Controls:** The permittee now has coverage under the nutrient GP.
- Part I.H.14. **Stream Model:** A stream model was submitted in accordance with the previous permit.
- Part I.I.3.-18. & Part I.J.2 **Land Application of Sewage Sludge:** These requirements are no longer applicable since the facility no longer land applies biosolids under the authorization of this permit.